Washington Institute



Individual Home Study Course in Higher Accounting

SECTION II

Cost Accounting, Systematizing and Auditing

Lessons 7 to 12 inclusive
With Exercises

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LESSON VII.

COST ACCOUNTING AND SYSTEMATIZING.

GENERAL COST ACCOUNTING PRINCIPLES; QUOTATIONS; CATALOGUES; PURCHASES; PURCHASE RECORDS; VOUCHER RECORDS AND FILING OF VOUCHERS OR INVOICES.

ADVICE TO THE STUDENT.

In addition to a general study of the text books and lessons, the student should refer to the indexes of the contents and look up all subjects to which the exercises (which will be found at the close of each lesson) may relate. He will then be in a position to intelligently solve the various problems and to submit satisfactory work which will earn a good award of marks.

If there is anything in the wording of the exercises the student does not quite understand, he should write the Board of Examiners for explanation and any questions will receive careful attention, although it must be understood that the solution of problems cannot be furnished until the student's work has come to hand.

The student's answers to exercises will be given attention as promptly as possible and the review of the Board of Examiners may, as a rule, be expected within ten days of their receipt.

In making up the answers to the different exercises, the student should use pen and ink or typewriter, and write only on one side of the paper, folding all sheets pertaining to any one lesson together and signing his name and address on every sheet.

LESSON VII.

Cost Accounting and Systematizing.

(226) COST ACCOUNTING.

In endeavoring to explain the principles and workings of efficient cost accounting methods which can be adapted to suit the requirements of different classes of business, it will be best first of all to show why accurate cost accounting has become so important a factor in the business world. In arranging these lessons we therefore propose to explain as much as possible as we go along and summarize afterwards. For illustration, in comparison with a trip on a railroad it is taken for granted that we know perfectly well where we are going, but the student will be able to ride over the road and get off for purposes of investigation wherever he pleases, thus gradually appreciating what he is expected to do when he finally arrives at the terminus. This Course is strictly educational, and it is our purpose to carry it through so that those who arrive at the terminus will be entirely worthy of their destination.

The student will undoubtedly have to devote a large amount of attention to the lessons and exercises in order to gain success, but if he will do the necessary amount of work, the results, we believe, will be far ahead of his expectations. There is a growing field of large dimensions for competent cost accountants, and they earn large salaries. In fact, the chances might be considered at present as unlimited.

The enormous expansion and development of commerce has resulted in an equally enormous development of competition, to such an extent indeed, that some corporations succeed in securing contracts by discounting their bills and thereby being able to make a slightly lower price than others through taking advantage of cash discounts.

One writer in describing the necessity for an organized system of manufacturing cost records, says:

"Probably no information which is placed before the manufacturer, or manager of a manufacturing plant, is of more importance than an accurate computation of the cost of manufacturing each separate article that is made and goes out to the market to be sold.

"A manufacturer who is producing from 100 to 2,000 different articles in his line, with a pay roll of possibly $10,000 to $20,000 per week, divided up amongst all classes of producing and non-producing employes, and who is paying out another considerable sum for raw materials, would naturally want the most accurate way possible of knowing what each one of these pieces cost him, especially if the cost of this information were very moderate.

"The manufacturer can readily understand the immense power and advantage he would have in these times of tremendous competition if he knows,

accurately, his costs. With this information he can give prices that will gain him the business, and still be sure of profit. His competitor without this information might gain the business by estimating low, and then lose a large sum in filling the contract."

Another writer says: "In the present condition of commerce every manufacturer, in order to successfully meet the competition which exists in all lines of business, must not only have a complete organization in his factory but a system for accounting and recording the operations which will give him easy and rapid access to any detail of the business."

(227) ORGANIZATION.

In considering any plan for the establishment of a cost accounting system in any factory, the first question to receive attention is the organization of the business.

When we refer to the organization we do not mean simply the executive staff, nor the body of workmen, but every member of the force from the president of a corporation down to the most humble laborer. All must be included in the scheme of organization or it is incomplete.

No organization can be effective unless it is harmonious; there must exist a spirit of co-operation if satisfactory results are expected. Wherever dissension exists an ineffective organization is found, and it will never become effective until the cause of dissension is removed, whether it be a physical condition, an ordinary laborer or an officer of the concern.

In some factories too little importance is attached to the question of co-operation. Some men when placed in positions which convey considerable authority apparently take the ground that co-operation is a one-sided proposition; they expect the co-operation of their subordinates but never seem to consider it necessary to co-operate with those under them. The most highly organized factories in the world (and, we might add, the most successful) are those in which the spirit of co-operation has been developed to the highest degree. These are the factories in which those in authority are always accessible to their subordinates; where every individual is treated with respect; where labor troubles have been reduced to a minimum. A general chart of organization is illustrated on opposite page.

(228) CLASSES OF COST ACCOUNTS.

Manufacturers' cost accounts may be roughly divided into two principal classes; as applying to (1) those factories where special work is made to order, and (2) those where quantities of the same kind of article are manufactured, and where it is possible to establish standard units of cost. These are called "Continuous Process" factories.

Many factories combine both classes, such as those where are made standard and special tools, agricultural implements, wagons, carriages, automobiles, furniture, etc.

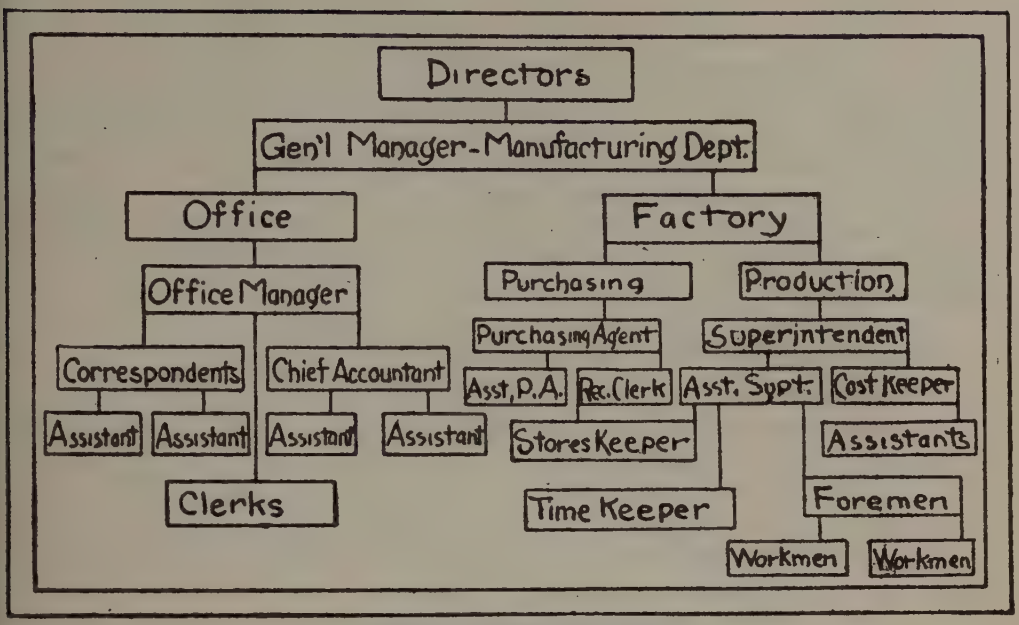


CHART OF ORGANIZATION.

Let us take for example a furniture factory making chairs, tables, couches, ornamental stands, etc. It is not necessary in such a case to install a complex system of time records, as a certain standard of material used and time occupied can be established. One chair of a certain kind and style should cost exactly as much as another chair of the same kind and style. The first thing the manufacturer should do, therefore, is to fix the standards, and then hold the foreman, or superintendent, responsible for maintaining them.

Where a number of standard parts are manufactured a standard unit should be established in regard to each part as if it were a separate article, the assembling of the parts being treated as a separate process with a standard unit.

One of the principal duties of the accounting department is to provide a check on the cost of the various processes making up the total cost of production, and this is usually accomplished by means of a cost ledger. The term "Cost Ledger" simply applies to those statistical accounts which are carried either as part of the general ledger system of an office or as memorandum accounts for statistical purposes. These accounts may be carried on loose leaves, or cards, in a separate book, or in a section of the general ledger, and those accounts which form part of the general ledger usually consist of raw material, supplies, labor and factory expense accounts.

For statistical purposes, and clearness and utility of comparisons derived therefrom, it is best to carry separate accounts with all important classes of material and supplies going into the manufacture of the product of the factory, so that a check may be applied not only on the material, supplies and

labor in bulk, as accounted for by the factory records, but also in detail. It is not enough to ascertain that there is a leak in a certain department. It is also necessary to locate the exact position of the leak.

In special order factories, the product may be debited to finished or manufactured goods account, as completed and this corresponds to purchase account in an ordinary commercial business.

In a continuous process factory, separate finished goods accounts should be carried with each grade of product or each separate kind of article manufactured.

(229) GENERAL ELEMENTS OF COST.

The general elements of cost of product may be classified as follows:

1. Raw material
2. Cost of manufacture
   - Labor
   - Factory expense
     - Power
     - Salaries and unproductive labor
     - Horses and cartage
     - Lighting
     - Heating
     - Supplies
     - Depreciation
     - Rent
     - Taxes
     - Insurance

In order to grasp the correct principles of cost accounting the best plan will be to formulate a general program of requirements which must be carried out. It will then be much easier to trace the development of a system step by step until it is as complete as we have so far learned how to make it. The difficulty about the majority of articles published on the subject is: that they simply describe what has been done and not why it was done.

The general program to be followed may be thus outlined:

A. Record of material ordered, including quotations.

B. Record of material received.

C. Record of material issued from stores and balance on hand.

D. Shop orders and sub-orders.

E. Record of transfers of material from one manufacturing department to another.

F. Record of time expended and material and stores used.

G. Distribution of factory expense and fixed charges.

H. Record of total cost with added percentages of general expense.

I. Statistical Cost Summaries, and Comparative Records.

(230) PURCHASES OF MATERIAL.

As a commencement, we will take an ordinary manufacturing establishment and one of the first things we have to attend to is the matter of purchases. In charge of the purchasing division is the Purchasing Agent whose duty it is to make all purchases of raw material and supplies required in the factory. He must collect and keep on file all available information tending to show where the materials required can be purchased to the best advantage. He is expected to order goods that may be required and to follow up his orders to insure prompt deliveries. He must also see that the quality and prices of goods received correspond with his specifications, and that the quantity corresponds with the invoice. In large factories the work of the purchasing department often requires the services of a purchasing agent and several assistants, while in smaller factories the duties of the purchasing agent may be performed by the superintendent or one of the principal officers of the concern. In either case, his duties may be said to commence with the effort to purchase the best material in the cheapest market, and with this object in view, he will

(*a*) Obtain a list of the best houses from whom to purchase his material and supplies.

(*b*) Obtain catalogues and arrange suitable indices for convenient reference thereto.

(*c*) Obtain quotations and list them, with particulars of discounts, for convenient reference.

(*d*) Arrange an efficient system for handling orders and receiving goods.

(*e*) Arrange a suitable system for handling bills received, as the purchasing agent is vitally interested in having full particulars of purchases at hand whenever required for purposes of reference and comparison.

(231) QUOTATIONS.

Every purchasing agent receives many special quotations on goods which are not immediately required. These, to be of future value, must be properly recorded and classified.

The most satisfactory method is to use either cards or a loose-leaf book and assign one card or sheet to each article for a record of quotations.

A simple form is illustrated. The form should provide such information as the name of the article, unit, quantities in which purchased, dates of quotations, names and addresses of firms quoting price, whether delivered or f. o. b., catalogue number and how quoted, whether by letter or salesman. Under the head of unit is noted the quantity on which the prices are based, such as dozen, pounds, tons, yards, etc.

On this form is entered a synopsis of each quotation received, a glance

Article _____ Unit _____

Date			Name	Address	Price	F.O.B. or Deld.	Cat.

FORM 1.

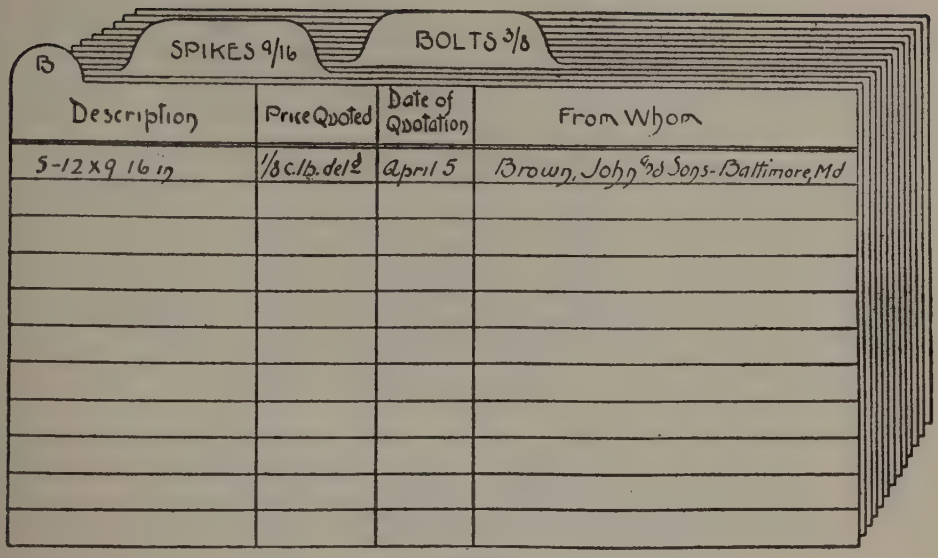
showing what prices have been named by each different concern. When the space on one card or sheet is filled, another is added. The quotations being entered in the order of their dates, the last sheet or card always shows current prices. When the quotations on one sheet are no longer of value, they may be removed from the current quotations, but should be kept on file as a record of the fluctuation of prices.

These quotation sheets should be filed in alphabetical sequence under the names of the articles. If the card index is used, one of the small desk boxes, made to fit the drawer of the desk, will be found entirely satisfactory. The size of the card may be 3 x 5 inches, but a card 4 x 6 inches in size is more practical. Or a small loose-leaf binder holding sheets about the same size will answer every purpose, and by some will be considered more satisfactory than cards. Either method of filing permits the purchasing agent to keep his quotation records in his desk where they can be instantly found.

The matter of accurate quotation records is of the utmost importance as, for example, in a business connected with iron, the market price is always variable, and if it is desired to build a bridge, if the company has not a contract for the iron away ahead, it is usually impossible to get it without considerable delay. In contracting for the bridge, the price of iron is necessarily included in the estimate. If the iron is not contracted for in advance, the price may be very different to that included in the estimate, the consequence being that the contract may involve a loss instead of a gain.

In a business of this kind, the clerk looking after quotations must be as active and resourceful as a Wall Street operator who buys and sells bonds, and it is unnecessary to say that if the iron has not arrived or has not been shipped, the building of the bridge cannot proceed, and the delay is very expensive.

In ordinary manufacturing establishments, however, the trouble is not so great, and the purchase agent is furnished, whenever necessary, with a memorandum from the stores-keeper, or receiving clerk, or whoever may be in charge, in regard to anything approaching the minimum quantity on hand.


B

SPIKES 9/16 BOLTS 3/8

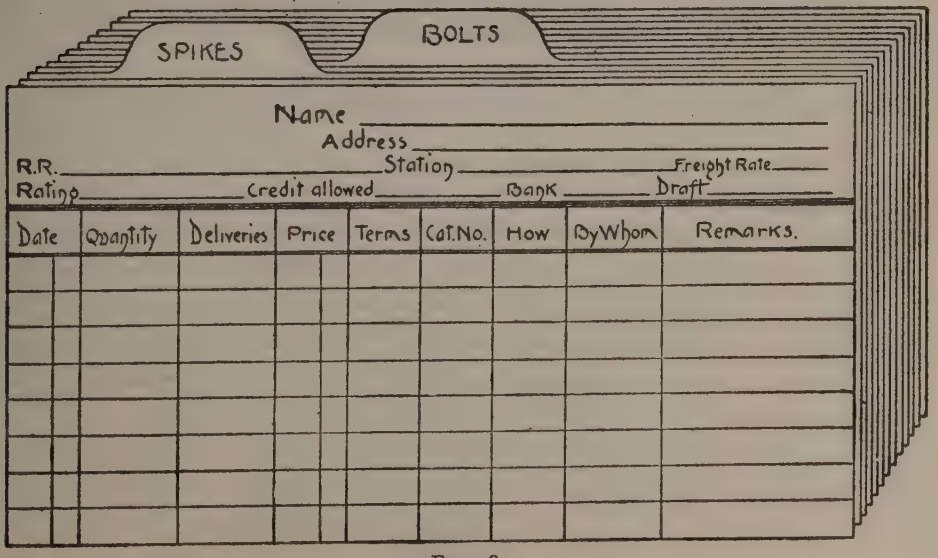
Description	Price Quoted	Date of Quotation	From Whom
5-12x9 16 in	1/8 c.lb. del'd	April 5	Brown, John & Sons-Baltimore, Md

FORM 2.

Quotation records, therefore, belong strictly to the purchasing department, and the purchasing agent makes his selection from the concerns from whom he receives quotations. Form 2 shows the use of guide cards to segregate the different articles and tab cards to indicate the name of the firm making quotation.

(232) COMBINATION LIST OF DEALERS, QUOTATIONS AND CATALOGUES.

A list of dealers, and a record of quotations received may conveniently be combined in one card system as per form of "Combination List of Dealers,


SPIKES BOLTS

Name _____

Address _____

R.R. _____ Station _____ Freight Rate _____

Rating _____ Credit allowed _____ Bank _____ Draft _____

Date		Quantity	Deliveries	Price		Terms	Cat. No.	How	By Whom	Remarks.

FORM 3.

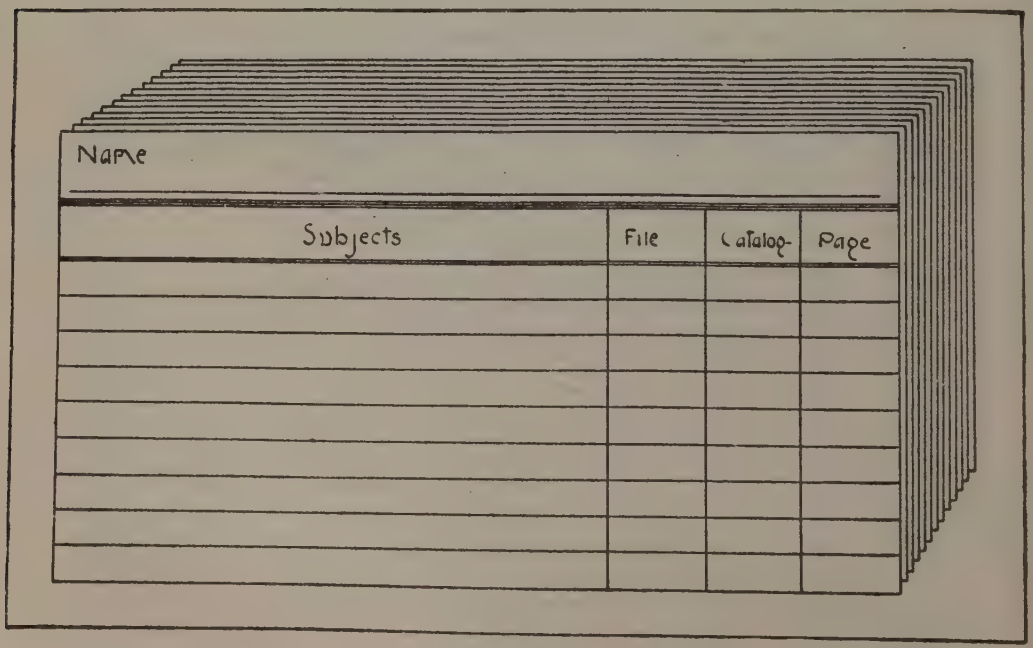
Quotations, and Catalogues Received," now submitted. It will be noted that the card has been so arranged as to make it equally available as a record of quotations to customers, thus being a practical illustration of how to obtain efficient records with a due regard to economy.

For the purchasing agent the various headings of Form 3 have the following significance:

Name and Address of Dealer.
Railroad—Over which freight will be shipped.
Station—Where shipments will be delivered.
Freight Rate—If F. O. B. point of shipment, or point of destination.
Date—Of quotation.
Quantity—On which quotation is made.
Deliveries—When promised.
Price—Quoted.
Terms—Discounts and due dates.
Catalogue—Indicating if catalogue is on hand, and where it may be found.

(233) THE FILING OF CATALOGUES.

When catalogues are received, the best method of filing is numerically, as hereafter illustrated. To refer to a catalogue, however, when using the combined form, first turn to the dealer's card, which will show whether a catalogue has been received, and under what number it will be found.



FORM 4.

If a separate catalogue index is found desirable for subjects, it may be provided by the use of a card system as illustrated in Form 4.

For the filing of catalogues, sectional book-cases will be found the most convenient, as, the doors being of glass, the numbers on the backs of the catalogues are plainly visible from the outside.

Catalogues should, as far as possible, be arranged similarly to books, only those that are too long being laid flat on the shelves.

In some establishments it will be found desirable to keep all catalogues relating to particular departments of the business together. This can be arranged by providing a separate series of numbers for each section of catalogues; thus, catalogues relating to "Iron" might be numbered A 1, A 2, etc. Catalogues relating to "Lumber" might be numbered B 1, B 2, etc.

There are always numerous small catalogues, circulars and price lists, to be taken care of, which are too small to be placed among the larger books. These should be kept in letter files, and as the number is seldom large, they may be arranged alphabetically. Flat sheet files may be used, but a vertical file would be found more practical; then a separate folder can be used for the booklets, etc., of each concern.

In order that all catalogues which refer to similar classes of goods, etc., may be kept together, it is advisable that a series of numbers be set aside for each distinct class. As an illustration, take the catalogues of any large manufacturing concern—one series from 1 to 100 might be used for machinery catalogues, another from 101 to 150 for mill supplies, and so on through the different classes. Each catalogue would then be given a number in its appropriate class. This constitutes a sort of cross index, for if a man wishes to consult the machinery catalogues, without reference to those of any particular concern, he has but to refer to those in the first series of numbers.

(234) TOOLS AND MACHINERY.

Separate files should be kept for catalogues of tools and machinery, and parts of same, so that all particulars relative to this section of the plant may be assembled together.

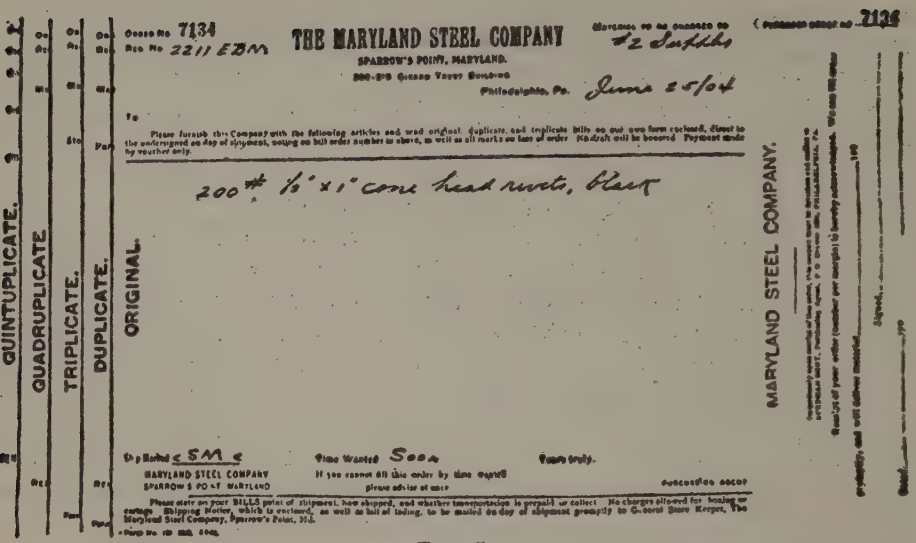
(235) SUPPLIES.

It would also be found desirable to provide a separate section of the file for information in regard to supplies that do not come under the classification of material used in manufacture of product.

In this department, as in all others, it will be found that sectionalization greatly facilitates easy handling, and quick reference for obtaining desired information.

(236) REQUISITION ON PURCHASING AGENT.

Before the purchasing agent places an order, he should demand a requisition showing by whom the goods are wanted and in what department they are to be used. This requisition should be in writing, and may come either from the factory superintendent, or the stores-keeper, according to the method in vogue.



FORM 5.

In the illustration submitted (Form 5), it will be noted that the main office, including the purchasing agent's department, is located at Philadelphia, while the stores are ordered for the factory at Sparrow's Point. The purchase order is made in quintuplicate, and the purchasing agent should always have a record that will show him when an order was placed, where it was placed, why it was placed, and when delivery may be expected. This may seem a rather formidable array of records, but when the proper systems are applied, all these records are easily provided.

The requisition may come from either of the following sources: First, from the stock department, for goods to be placed in stock. Second, from the order department, for goods not regularly carried in stock but required to fill orders. Third, from the heads of departments, for supplies or goods required in conducting their departments.

The requisition blank should indicate the department in which it originates. Here is where the scheme of using a different color for the blanks of each department comes in. If the color scheme is used, a glance at the requisition will show from what department it comes.

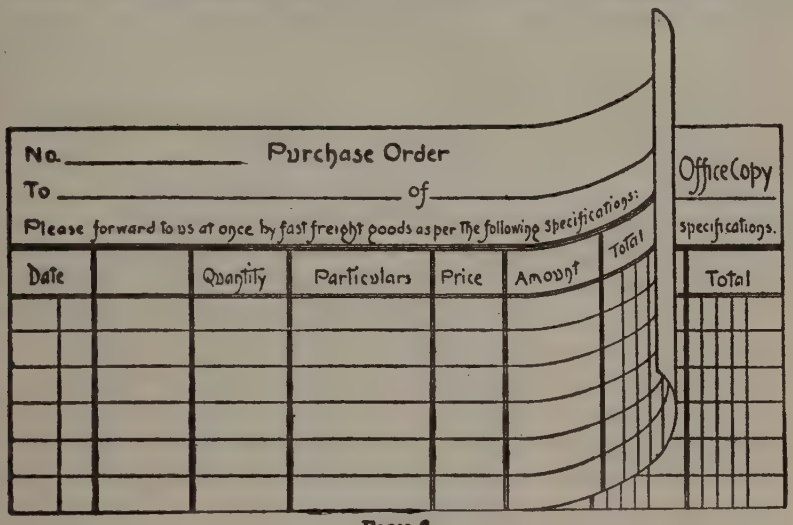
The requisition should specify very clearly what goods are wanted, and no purchasing agent should honor a requisition which does not give full information as to sizes, quality, etc. Every requisition should be either signed or O. K.'d by the head of the department in which it originates, and it should specify whether the goods are required for the use of the department or for some other purpose. The latter information is necessary for the use of the accounting department so that the invoices may be charged to the proper accounts.

When the goods have been ordered, the date of the order, and the name of the concern from whom ordered, should be entered on the requisition.

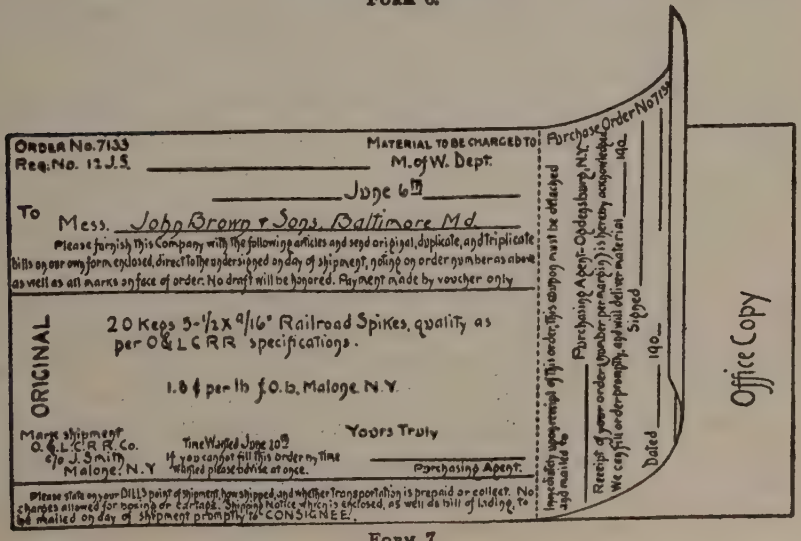
(237) PURCHASE ORDERS.

On receipt of this requisition, the necessary quotations having been obtained, the order is made out either in duplicate, triplicate or quintuplicate, as the requirements of the business may indicate. In the latter case, the disposition of the five copies may be as follows:

The original is signed by the purchasing agent and mailed to the concern from whom the goods are to be purchased. One copy is sent to the receiving clerk. He will file his copy under the name of the concern to whom it is addressed, so that it can be readily found when the goods are received. He may file it under the name of the goods, but filing under the name of the concern is most satisfactory for the reason that a package nearly always



FORM 6.


ORDER No. 7133
Req. No. 12 J.S.
MATERIAL TO BE CHARGED TO
M. of W. Dept.
June 6th
To Mess. John Brown & Sons, Baltimore Md.
Please furnish this Company with the following articles and send original, duplicate, and triplicate bills on our own form enclosed, direct to the undersigned on day of shipment, quoting our order number as above as well as all marks on face of order. No draft will be honored. Payment made by voucher only
ORIGINAL
20 Kegs 5-1/2 X 9/16" Railroad Spikes, quality as per O & L C R R specifications.
1.8 ¢ per lb f.o.b. Malone N.Y.
Mark shipment O. & L. C. R. R. Co. c/o J. Smith Malone, N.Y
Time Wanted June 10th
If you cannot fill this order in time wanted please advise at once.
Yours Truly
Purchasing Agent.
Please state on your BILL point of shipment, how shipped, and whether transportation is prepaid or collect. No charges allowed for boxing or cartage. Shipping Notice which is enclosed, as well as bill of lading, to be mailed on day of shipment promptly to CONSIGNEE.
Purchase Order No. 7133
Purchasing Agent Ogdensburg, N.Y.
Receipt of your order (number as above) is hereby acknowledged.
We can fill order promptly, and will deliver material
Shipped 190
Dated 190
Immediately upon receipt of this order, this copy must be attached and mailed to
Office Copy

FORM 7.

shows the name of the shipper, while it may be necessary to open the package to ascertain the contents. It is important that the receiving clerk have information which will enable him to receipt for the goods without delay. For filing the copies in the hands of the receiving clerk, a small loose-leaf binder is most satisfactory. If the number of unfilled orders in his hands at one time is quite large, the binder should be provided with a set of alphabetical indexes; otherwise this is not essential.

When the goods are received, the receiving clerk will check the items with his copy of the order. The copy is then returned to the purchasing agent, that he may know of the arrival of the goods.

Another copy is sent to the accounting department, where it is also filed under the name of the shipper. This copy is for the information of the accounting department in charging the invoice when it has been O. K.'d.

One copy is sent to the financial head of the concern for his information as to the obligations being contracted.

The remaining copy is for the files of the purchasing agent, and may be used to follow-up the shipper.

(238) THE PURCHASING AGENT'S FOLLOW-UP.

For following up orders so as to insure their delivery at the proper time, the purchasing agent's copy of the order may be placed in a suitable file tickler under the date when it will be necessary to give the order attention, or a card tickler may be used for this purpose, being provided with a set of thirty-one numbered indices to represent the days of the month.

The copy is placed in this file under the date on which an acknowledgment of the order may reasonably be expected. If the acknowledgment is not promptly received, the matter is followed up with a letter to ascertain if the order has reached its destination.

When the acknowledgment is received, it usually gives some information as to when the goods are likely to be shipped. The order is then filed ahead to the date on which the invoice should be received. This provides for another follow-up if notice of shipment does not come in. In this way, every order may be closely followed until the goods arrive. Even after the date of shipment, the order may be filed ahead to follow-up the transportation company.

When the goods are received they are checked off by the receiving clerk as to comparison with specifications on the order. If for a special job, the receiving clerk's copy of the order will be sent to the department for which the goods have been purchased as a notification that the foreman of the department may make requisition on the stores-keeper for them.

On receipt of notification of arrival of goods, and report as to their condition, etc., the purchasing agent will check the invoice in regard to prices and terms, and send it to the accounting department, where the extensions will be checked. The auditor will then O. K. the bill for payment, and the treasurer will sign the voucher check.

(239) PURCHASE RECORDS.

For his own information, the purchasing agent must have at hand complete statistics of the work of his department. As soon, therefore, as the invoices have been audited, they should be returned to the purchasing department, where, after being properly recorded and distributed, they will be filed alphabetically with a cross index for voucher numbers.

If a permanent record of purchases of each article is desired, this may be made an auxiliary record, using cards or loose sheets. A sheet would be used for each article and should show the name of the article, date of requisition and name of department, date of order, from whom ordered, and date and quantity received. These sheets or cards should be indexed under the name of the article.

Such a record is, in many instances, of great value. To illustrate, take a concern manufacturing a line of machinery. During the past year 2,500 machines of a certain pattern have been manufactured. For the present year 3,000 of the same machines will be made. In making up the specification it will be necessary to know what quantity of steel bars of a certain size will be required. This record furnishes the information, as it shows what quantity was ordered for the 2,500 machines during the previous year. It also shows what may be expected in the way of deliveries so that the purchasing agent may know about how far in advance of immediate needs he must place his orders.

Another point to be observed is that where there is a regularly established purchasing department, it is very desirable that the distribution of goods purchased should be kept by that department, as it is necessary to promote the efficiency of the work that the tabulated distribution of material and supplies and comparative records should be at hand for reference, and the duplication of work involved in keeping records both in the purchasing and accounting departments should be avoided.

(240) INVOICE FILE.

A plan of keeping track of invoices received which is quite generally adopted is by way of a sectionalized vertical file.

Section No. 1 will contain bills received, but not yet checked by receiving department, for the reason that the goods have not yet arrived, or been accepted.

Section No. 2 is for bills checked by receiving department, but not yet examined by the purchasing agent.

Section No. 3 is for bills passed by the purchasing agent, and ready to be checked for extensions and audited for payment.

Section No. 4 is for audited and paid bills awaiting vouchers, prior to being permanently filed away, all bills covered by any voucher being attached to it and filed under the voucher number. When the voucher system is not used, paid invoices should be filed alphabetically and chronologically in a vertical file.

It will be noted that we do not contemplate mailing invoices with the vouchers, as we consider this entirely unnecessary, and the cause of inconvenience and expense. A properly devised voucher check will entirely obviate any supposed necessity for following this plan.

Name
Address

Date	Voucher	Date	Voucher	Date	Voucher	Date	Voucher	Date	Voucher

FORM 8.

Numerical Voucher Index

	Jany	Feby	Mch.	Apr	May	June	July	Aug.	Sep.	Oct
J. O. Johnson				163						

FORM 9.

It is necessary to provide not only a record of totals of quantities and amounts of the various kinds of purchases, but also to have ready reference to particular bills of particular dealers. To effect this, a separate index is provided of names and voucher numbers. Two forms are illustrated.

(241) VOUCHER RECORDS.

A proper distribution or voucher record will furnish the desired information, and a recapitulation of monthly totals will furnish statistics in relation to total quantities and amounts of any kind of material or supplies purchased during a given period for comparison with other periods, or with production during those periods.

There are many different styles of purchase or voucher records, but the general principles followed in all are the same.

No bills are entered until examined and audited, after which they are entered in batches about once a week, all the bills from the same concern being assembled together under one voucher and extended in one total, this plan saving considerable clerical labor.

(242) VOUCHERS' PAYABLE ACCOUNT. AUDITED VOUCHERS' ACCOUNT.

The footing of the total column is credited at the end of each month to audited vouchers' or vouchers' payable account in the general ledger. A separate column is provided in the cash book on the cash paid side for audited vouchers paid, and the footing of this column is debited at the end of each month to audited vouchers' account in the general ledger. The balance of this account represents unpaid audited vouchers on hand.

This method is strongly recommended, as it keeps the books clear of all accounts, in regard to which claims are being made of shortages, rebates, reclamations, errors, etc., and saves a great deal of absolutely unnecessary work on the books in the way of adjusting entries.

All unaudited bills will be kept together in a file provided for that purpose, so that when taking inventory a recapitulation of the amounts may be readily obtained, and the total deducted from inventory, or added to the balance sheet under the general heading of "Sundry Accounts Payable," providing the goods have been received.

(243) VOUCHER CHECKS AND RECORDS.

In Lesson II we described the voucher system and furnished examples of voucher records and voucher checks. A very good example of the former will be found in paragraph 70, and the combination check book and voucher record illustrated in paragraph 71 is very practical.

In connection with the purchasing agent's department, however, we consider it advisable to enlarge on the general uses of the voucher system and the voucher checks. There seems to be a general idea that vouchers refer only to expenditures by check, but a perfect voucher system consists of a record not only of Accounts Payable or check expenditures, but also of expenditures of every nature, the voucher record being provided with columns for distribution to the proper departments.

The actual intention of the system is to do away with the necessity of maintaining individual accounts with creditors and thus economizing work on the books. The system has become so much improved in the last few years that it is no longer necessary to provide a separate voucher, as the voucher can in most instances be incorporated in the voucher check. When the voucher system was first brought into use, it was considered necessary in the case of a concern purchasing twenty times in a month to attach the voucher to the twenty invoices, attach the check to the voucher, and forward the whole record to the party from whom the purchases had been made. In very many cases the voucher and the invoices never came back, and even though they did, it involved an unnecessary waste of time, trouble and postage; this is therefore considered rather an unsatisfactory system. It was never necessary to return the invoices with the voucher, and it is now found unnecessary to send the voucher, so it is evident that a very definite reconstruction of the voucher system has been accomplished.

VOUCHER RECORD

Line No.	Date	Voucher No.	Name	Vouchers Payable	Disc't	MATERIAL PURCHASES							PRODUCTION DEPT.					
						American Cotton	Brown Cotton	Waste	Dye-stuffs	Yarn	Fuel	Supplies	Labor Cotton	Labor Yarn	Labor Kontract	Factory Expense	Freight	
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		

FORM 10.—LEFT-HAND PAGE.

190

MAINTENANCE						GENERAL EXPENSE						SELLING EXPENSE				SUNDRIES			NO.
Engine Room	Card Room	Dye House	Kitson Room	Yarn Room	Miscel	Salaries	Insurance	Postage Telephone Telegraph	Office Supplies	Office Expense	Labor	Salaries	Traveling Expense	Outward Freight Cartage	Labor	Account	Fol.	Amount	No.
																			1
																			2
																			3
																			4
																			5
																			6
																			7
																			8
																			9
																			10
																			11

FORM 10.—RIGHT-HAND PAGE.

Audited Vouchers for the Month of _____

Date Ent	Voucher No.	Name	Accounts Payable	Discount	PRODUCTION DEPARTMENT						Total
					Timber	Oil	Labor	Waste Packing etc.	Freight	Factory Expense	
		Brought Forward									
	652	Fuller and Fuller	92 56		92 56						
	653	S. Small and Co.	115 00								

FORM 11.—LEFT-HAND PAGE.

In illustrating voucher or purchase records, it will be noted that in some cases the heading "Vouchers Payable" is used, in others, "Audited Vouchers," and in others "Accounts Payable." This is simply a matter of individual preference, but we prefer the second title mentioned. In any case it indicates the total column, the grand total of which is posted at the end of each month to the credit of the account in the General Ledger.

March 1905

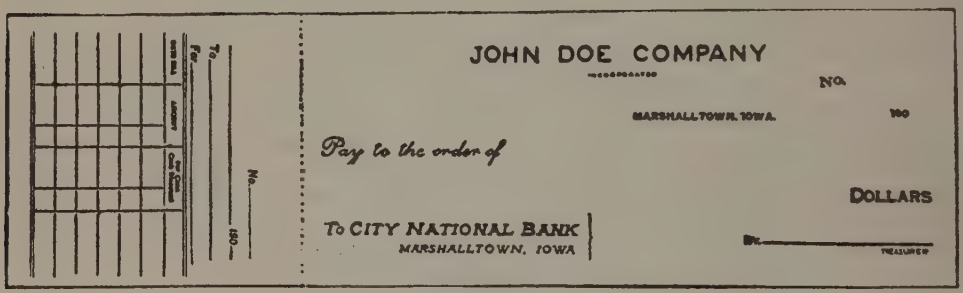
MAINTENANCE OF PLANT						REAL ESTATE AND IMPROVEMENT								
Repairs to Buildings	Repairs to Machinery	Repairs to Tools	Feed	Shoeing	Total	Land	Buildings	Machinery	Tools	Advertising	Postage	Freight and Expense	Furniture and Fixtures	Total
		15 00							100 00					

FORM 11.—RIGHT-HAND PAGE.

In the case of petty cash, it is understood that what is called the "Imprest System" is used, and the voucher in this case would, therefore, be to make up the amount, which the cashier is supposed to hold intact. The petty cash vouchers need not be entered in the Voucher Register, but should be filed in order of date. In large businesses the petty cash vouchers are filed every day, and the sum allowed the cashier is restored each day to its original amount.

What may be termed the standard voucher check is one which has been officially approved by the American Bankers' Association. A recent author says, "I cannot conceive why it should be at all necessary to adopt the voucher check made to fold," and this appears to be the principal objection bankers have to the voucher system. Where the voucher is made to fold it has frequently in some way gathered up other ordinary checks and they have not been found for some time.

The principle of this standard voucher check is that a stub is attached on the left-hand side separated by a perforation. The particulars are duplicated



FORM 12.

by the use of a carbon sheet and the party to whom the payment is made is expected to detach the stub from the check before depositing the check in the bank.

Another form is here illustrated, which does away with the stub feature, as well as the objectionable fold, and gives no information on the check proper, which the drawer or drawee may desire to keep from the observation of others. By means of an attached remittance letter it gives the recipient of the check full particulars as to its purport, the duplicate or carbon copy being retained by the drawer, folded to proper size and filed by voucher number after being entered.

This system can be safely recommended and can easily be adapted to general use.

Still another form is shown which conforms to the standard set by the American Bankers' Association and records on the voucher check itself detailed information as to the bills included in the payment.

With regard to the treatment of unpaid vouchers one of the forms illustrated in Lesson II shows a monthly distribution of unpaid balances and this

The Business Man's Publishing Co. Ltd.

Detroit, Mich. _____ 19__ No. _____

Pay to the order of _____ $ _____

_____ Dollars

TO THE PENINSULAR SAVINGS BANK
DETROIT, MICH

The Business Man's Publishing Co. Ltd.

_____ TREASURER

DETACH CHECK BEFORE DEPOSITING

The Business Man's Publishing Co. Ltd.

Detroit, Mich. _____ 19__ No. _____

Attached find check in full payment of the following items. NO RECEIPT NECESSARY

DATE	DESCRIPTION	DISCT	AMOUNT	DEDUCTIONS	BALANCE

COMBINATION VOUCHER-CHECK AND REMITTANCE LETTER.

FORM 13.

VOUCHER NO. _____ THE METROPOLIS MANUFACTURING CO. CHECK NO. _____

CORRECT _____ AUDITED _____

THE INDORSEMENT OF THIS CHECK ACKNOWLEDGES PAYMENT IN FULL OF THE ABOVE ACCOUNT.

TOTAL _____

CHICAGO, ILL. _____ 19____

THE NATIONAL BANK OF THE METROPOLIS, CHICAGO, ILL.

PAY TO THE ORDER OF _____

_____ DOLLARS

_____ PRESIDENT

_____ TREASURER

STANDARD FORM VOUCHER CHECK.

FORM 14.

form of voucher record furnishes useful suggestions. The total of the unpaid vouchers column will agree with the balance of the voucher payable account in the general ledger. In adopting any method of this kind it will be found preferable to use loose leaf voucher records as by this means as each page of entries is completed by full payment being made, the page may be removed and only those pages which contain unpaid items will remain in the binder.

SPECIALIZATION.

We do not undertake in this course to cover whole ground of manufacturing costs and their special adaptation to various special manufacturing lines, but we will lay down the important principles and rules which will govern any well ordered system of cost accounting, and supplement these principles and rules with numerous illustrations of various kinds, and relating to various classes of product. The subscribers to the Course should theoretically adapt these principles and rules to the businesses with which they are personally familiar, compare them with the methods now in use, note the effect and ascertain how, and why, they should be modified in these particular cases in order to obtain the best results.

We have shown how complete records may be kept in a purchasing department; how special quotations are recorded; how requisitions are handled; how orders are made in duplicate and the copies filed to show dates of shipment and quantities purchased from each concern; how a record is kept of the purchases of each article showing manner of delivery. A careful study of the system will show that all of these records are maintained with a minimum expenditure of time and labor. It is mainly a question of proper classification provided by a proper system of filing.

If the concern is large enough to require the entire time of a purchasing agent, complete records will be very necessary. But in those cases where the purchasing agent has other duties a complete system to handle the details is all the more necessary to the end that too much of his time will not be required in the purchasing department.

By way of contrast, and to emphasize the importance of system, we will point out some of the conditions which exist in concerns employing no adequate system in the purchasing department, tracing an order from the time the requisition is made.

The engineer finds that the supply of coal is running low. He informs the first person in authority whom he meets; the superintendent perhaps. The superintendent tells some clerk in the office to order a car of coal and he sends an order to the shipper. In the meantime the manager happens into the power house and notices that the coal is low. He immediately goes to the office and dictates an order for a car. The invoices come in and it is found that two cars have been ordered where but one was needed.

On the other hand, perhaps the order has been entirely forgotten. Three persons, the manager, superintendent and engineer, knew that coal was

needed, but each falls back on the excuse that he supposed the other had attended to the matter. Note how all this confusion would have been avoided by having all purchases made by one man, and requiring a written requisition from the superintendent.

Take another illustration. Certain supplies used in the factory, which are purchased at infrequent intervals, are needed. The superintendent notifies the person who usually does the buying. He asks where the goods are bought, but the superintendent does not remember; neither can remember what firms make those particular goods. Then follows a search through catalogues, letters and invoices. The catalogues are all piled together on a shelf (those that have not been appropriated by some other department) and the best that can be done is to make a guess as to the catalogue in which the article will most likely be found.

As it has already taken an hour or two to find the name of a manufacturer the order will probably be placed with the first one. The buyer does not know what he paid for the same article last year or from whom it was purchased. He does not know that he has received a low quotation from another house; or if he does have a hazy recollection of such a quotation, he only knows that there is probably a letter somewhere in the files, but from whom he cannot tell. He does not know where to look for further information, so places the order and takes a chance on the price being right.

We have described an extreme case, but some, if not all, of these conditions exist in a great many concerns, and these conditions do not apply to small concerns alone, but to many large ones as well.

EXERCISES.

1. Explain in your own language the duties of the Purchasing Agent and state what records should be kept by his department to insure the greatest efficiency.

2. Submit illustration of form for quotation record, explain why you consider it desirable or necessary and describe a suitable method of filing all information received in regard to quotations or catalogue prices.

3. When one department of a factory buys from another department goods which may be bought in the open market, but for a price in excess of the original cost, what price should be reported to the purchasing department in connection with the transaction? Why so?

4. A factory is situated in Adrian, Michigan. The head office, purchase department and selling agency are located in Chicago.

Illustrate methods of recording purchases of raw material and supplies, commencing with requisitions originating with the foremen of the departments of Adrian, Michigan, and covering all steps necessary until the goods are delivered to the factory.

Illustrate and explain uses of follow-up system for unfilled purchase orders, advice to purchasing department, receiving clerk and stores-keeper as to orders and receipt of goods, including disposition of requisitions, purchase orders, etc.

5. Illustrate a form of voucher record suitable for the requirements of some particular business you may desire to indicate allowing for the treatment of unpaid or partially paid vouchers. Explain the variations between this form and those illustrated in connection with this course, also the conditions which make the particular features necessary or desirable.

LESSON VIII.

COST ACCOUNTING AND SYSTEMATIZING.

STORES; SUPPLIES; MATERIAL RECORDS; PERPETUAL INVENTORIES; TOOLS AND REQUISITIONS.

LESSON VIII.

Cost Accounting and Systematizing.

(244) THE STORES DEPARTMENT.

In considering the organization of the stores department, the first requisite is to make some one person responsible for the proper conduct of the department. This person may be referred to as the Stores-Keeper. This does not necessarily imply that in all cases there must be a stores-keeper, having no other duties, but that some one shall perform the duties of stores-keeper. In small factories the duties of stores-keeper may be performed by the superintendent, a department or shop foreman, the cost accountant or some other employe. The duties of stores-keeper will, however, require the entire time of at least one man in factories of considerable magnitude; and in many smaller factories, where a stores-keeper has not been employed, the addition of such an employe will result in economy in the end.

No matter what the size of the concern, the principles of stock-keeping are the same, and if the system is simple and arranged to meet the requirements of the concern in which it is to be used, the department can be conducted economically. In fact, there is no question but that the operation of a stock department in any concern will be a money and time-saver rather than an expense. We illustrate on the following page a chart of the duties of the stores-keeper, which shows a general outline of the records that he should keep.

(245) RECORD OF MATERIAL RECEIVED.

The first thing to be done when stores come in is to make a record of their receipt. In concerns employing a receiving clerk, he is the proper person to certify the receipt of stores. In addition to the report which goes to the main office, it is necessary for the receiving clerk to make a report to the stores-keeper for his records.

In some establishments, however, the receiving and shipping rooms are combined, and in many cases the stores-keeper will also act as receiving clerk.

In the former case, as previously explained, the receiving clerk is furnished with a carbon copy of the purchase order and fills in the quantities as he counts the goods received. This receiving slip is then returned to the purchasing agent, who checks off his copy of the purchase order therefrom, after which it is forwarded to the stores-keeper.

This answers very well where all items on the order are received at one time, but where the order includes several shipments, we recommend a separate report of goods received. The receiving clerk should at all times have on file copies of all unfilled orders.

Where the duties of stores-keeper and receiving clerk are combined, the stores-keeper will certify to the quantity of material, as received, being in accordance with the quantity called for in the bill. A notation similar to our

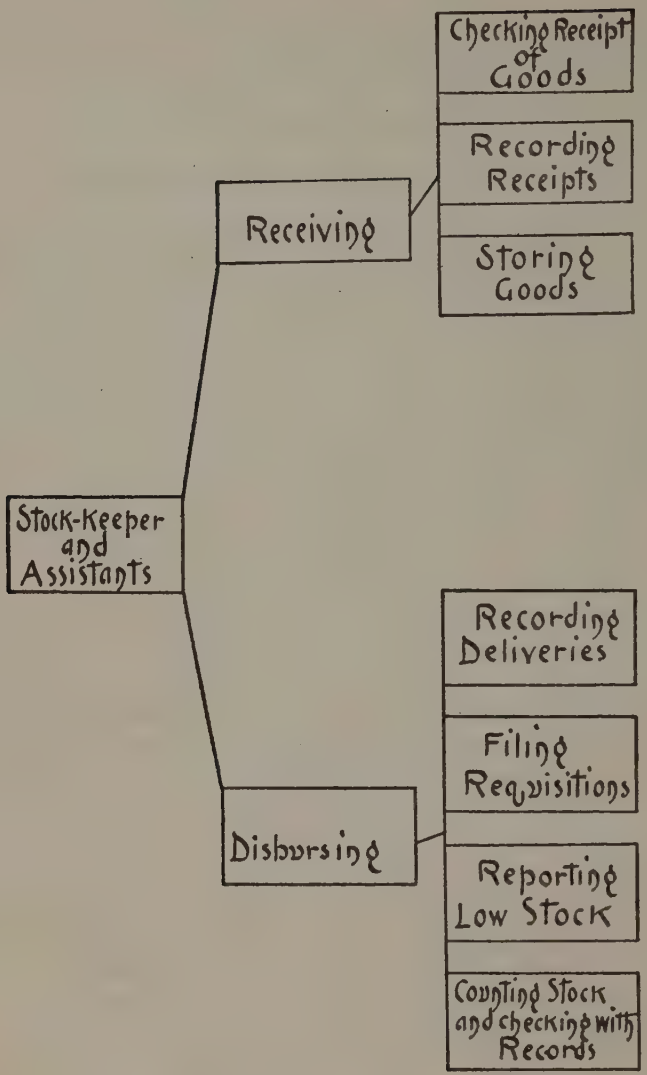


illustration may be stamped on the invoice and signed by the stores-keeper on the "quantity correct" line.

STORE-KEEPER'S No.
QUANTITY CORRECT
PRICE
ENTERED JOURNAL FOLIO
CHARGE TO ACCOUNT

In case it does not seem desirable to refer the invoices to the stores-keeper, he may make a daily report of "goods received" to the main office,

this report being checked against the invoices. The reports should be made in duplicate, one copy being retained by the stores-keeper, from which the stores ledger is posted.

Two simple forms are here illustrated:

Receiving Slip

Date

Quantity	Articles	Received From	Condition

Receiving Clerk.

FORM 1.

Daily Report of Goods Received

Sheet No 25

Receiving Clerk S. Swanson Dept. No 4 Date Feby 22nd 1903.

Received from	Goods Received	Quantity	Car Number	How Received	Requisition No	Invoices No	Invoices Amount	Freight or Express	Account Charged	Department Receipt Received By	Dep. No.
Decker Drainard Co.	Milling Machine	1	164364	Freight	A 6140	16	300	1 25	Machinery Const	R Fenton	32
Robt. Sawyer	Emery	200 lbs.		"	A 6720	17	12		Factory Expense	L Menson	5
J. Renter	Brushes (MT)	25		"	A 6540	18	12 50		Stock	S. Swanson	4
	L. Composition	100 lbs.		"	"	"	6	30	Factory Expense	W. Walters	21

FORM 2.

The amounts of the invoices are recorded in a purchase or accounts payable record with proper distribution and the totals will be agreed each month with those on the stores-keepers' report sheets.

(246) DUTIES OF THE STORES-KEEPER.

After checking off the goods received from the receiving department, the stores-keeper enters the quantities on his stores ledger cards. Although, as a general rule, it is not necessary to enter the prices of material or supplies on the stores cards, it is an advantage to do so where the cost of raw material varies with market movements. In such cases, it is quite possible that the stores-keeper may fill a requisition with stores billed at two prices; and it is only by furnishing him with the necessary particulars as to prices, or by adopting some similar expedient, that the correct cost of the raw material used can be obtained.

It should be the duty of the stores-keeper to properly store all materials received, issue same on properly executed requisitions, and keep an accurate record of quantities received and quantities issued, from which may be ascertained the quantities in his hands.

The property in charge of the factory stores-keeper is properly classified under two heads, namely, materials and supplies; and sometimes there is the third class consisting of tools, where a separate tool room is not maintained. Of the two classes named, "material" consists of all raw material entering directly into the manufacture of the goods. "Supplies" embrace all those articles required for the operation of the factory, such as lubricating oils and all similar articles.

The most simple problems in stock-keeping are found in manufacturing and jobbing concerns where the stock is handled in large quantities. There is only one satisfactory method of keeping stock records, and that is to have the record of each separate item on a separate sheet, or card. In any stock certain items will always move much faster than others, with the result that on the records of some the entries will be many, while on others they will be few and far between. For this reason, a bound book for the purpose is impractical; like an old-fashioned bound ledger, a periodical transfer of all of the records is necessary.

Both cards and loose-leaf books are used to advantage for this class of records. Where the primary object of the system is to provide a perpetual inventory or record of stock on hand, cards are entirely satisfactory. If, however, it is desired to show the quantities handled during a certain period, the loose-leaf book is preferable for the reason that the sheets being larger more entries are accommodated and the record is shown for a longer period. In addition to the quantity disbursed, the record should show by what department or for what purpose the goods are drawn.

Where it is deemed advisable to keep a constant check on the amount of material used in the factory, or issued by the stores-keeper, this can be conveniently accomplished by having requisitions made in triplicate so that copies of requisitions are forwarded daily to the office. Duplicate stores cards may also be kept in the office, the receipts being entered from the purchase orders previously mentioned.

We show herewith a simple form for a record designed for the use of a jobbing or manufacturing concern. Starting at the left of the card on the top line, the first space is for the name of the article, a separate card or sheet being used for each article in the stock. Following this is the size or kind. In the third space is entered the unit by which the article is known, such as pounds, dozen, yards, etc. Subsequent entries of quantities are then made with respect to these units. The fourth space shows where the goods are stored, the bin or shelf number being entered. The three spaces at the right are for a record of high, normal, and low stock limits. For each article in stock there should be established such limits so that when the stock reaches the danger limit (either too high or low) it will be noticed by the stockkeeper when making the entries.

Article		Size or Kind	Unit	Where Stored		High	Normal	Low

Received		Delivered			On Hand	Delivered			On Hand	Delivered			On Hand
Date	Quantity	Date	Order No.	Quant.		Date	Order No.	Quant.		Date	Order No.	Quant.	

Form 3.

Below the headings above described is the stock record proper. One column is provided for a record of goods received, while there are three columns for goods delivered. The goods are naturally received in much larger quantities than those in which they are delivered and there are very many less entries. Under the head of "Received" is given the dates and quantities. In recording the deliveries the date, order number and quantities are given—the order number being the order or requisition on which the goods are delivered. A column is provided for the amount on hand, it being intended that the balance shall be extended whenever an entry is made on the card.

In continuous process factories the stores-keeper will receive numerous requisitions for the same article. It will not be necessary in such cases to enter each separate requisition on the stores card; all requisitions for the same article may be kept together and an entry of the total amount made once a day.

In connection with the high, normal and low limits shown at the top of the form, adjustable tabs or markers are often used to automatically indicate when any stock is running low. These adjustable tabs are made in the form of steel clips, which may be slipped on and off of the sheet. When stock is received one of these markers is placed in the proper position on the sheet, and as the stock is delivered the marker is moved forward to "normal" or "low." It should be one of the duties of the stock-keeper to give notice whenever any article is running low, and when the low point is reached, notice should be sent to the office at once. It is a good plan to provide the stock-keeper with a report form, as shown, on which to make his daily report.

The Following Goods Have Reached The Low Limit

Articles	Low Limit	On Hand

Date

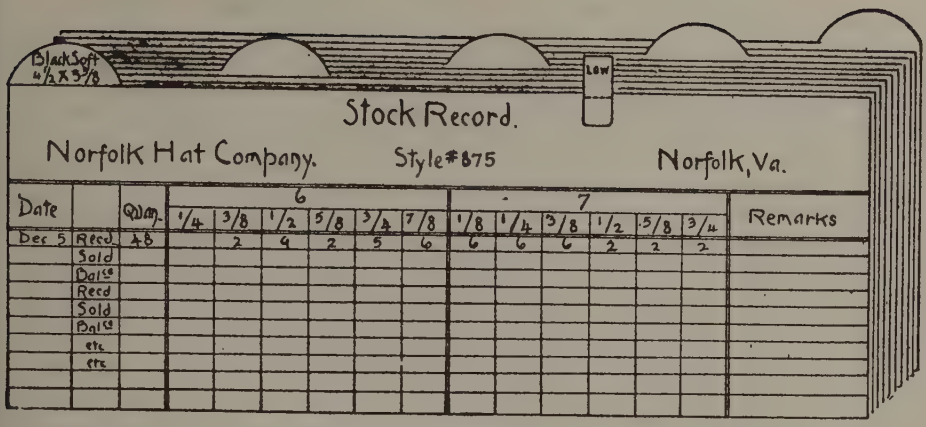
Stock-keeper

FORM 4.

Where the purchasing agent is located at the main office, more or less distant from the factory the stores-keeper finding that certain material or supplies need replenishment makes a requisition on the purchasing agent for same.

It will be readily understood that as the markers or tabs project above the edge of the sheets, a glance will show what items are low. By consulting the file daily the manager can obtain full information about his stock—the position of the markers will show of what goods he has too large a quantity and what he should buy.

These markers or tabs, made for just such purposes are now carried in stock by most stationers and can be purchased at a low price. The stock record shown in Form 5 is well adapted either for loose leaf books or card indexes. Where the stock is very active, large quantities being handled with the consequent large number of items, the loose leaf book possesses advantages over a card index. The cards are, as a rule, not larger than 5 x 8 inches in size, while loose leaves can be had in any size desired. A larger sheet provides for more entries, and where a large sheet is required it can be more conveniently handled in book form.



Stock Record.

Norfolk Hat Company. Style #875 Norfolk, Va.

Date		Quan.	6						7						Remarks
			1/4	3/8	1/2	5/8	3/4	7/8	1/8	1/4	3/8	1/2	5/8	3/4	
Dec 5	Recd.	48		2	4	2	5	6	6	6	6	2	2	2	
	Sold														
	Bal'c														
	Recd														
	Sold														
	Bal'c														
	etc														
	etc														

FORM 5.

The larger sheet afforded by the loose leaf book is also more convenient when values are shown by the stock record. This is provided by adding, after the columns showing quantity, other columns ruled for dollars and cents.

(247) LOCATION OF STORES.

One of the important matters to be considered in connection with the stores is the proper location of the various classes of materials and supplies. As far as possible the stores should be located conveniently to the departments of the factory in which they are to be used. In most factories the materials required are of such a nature that all cannot conveniently be stored in the same place, but a great saving in labor can be effected by a little study and the exercise of good judgment in locating the different storage places.

Rough stores of certain classes are very frequently stored outside of the main buildings. This is always true in the case of lumber and similar bulky stores.

In machine shops, special methods are employed for taking care of rough stores such as iron and steel bars. Those in the large sizes are carried in racks outdoors. In one establishment of this kind, these racks run underneath an elevated railway trestle, and are replenished by means of a locomotive crane.

Less bulky materials may be stored in a general stores room, and in some cases it may be advisable to provide two or more stores rooms in different parts of the plant. As a rule, however, we advise one central stores room, located as conveniently as possible to all shops.

In the arrangement of the stores themselves the same idea should govern. The heavy articles should be so placed that the work of handling them will be minimized. Stores frequently called for should be placed within easy reach, while those seldom needed may be placed in the more inaccessible corners.

(248) PERPETUAL INVENTORY OR STORES RECORD.

For his record of stores, the stores-keeper should be provided with a stores ledger either on the card or loose-leaf plan. Which is better depends on the kind of goods manufactured, the class of materials, and the information which is to be shown on this record. In many factories both can be used to advantage.

The stores ledger should be indexed according to class of material and the cards subdivided by sizes. If a card ledger is used, the index is provided by guide or index cards having tabs which project above the record cards so that they instantly catch the eye. Take the item of steel bars as an illustration. For the main division, in which is kept a record of all steel and steel parts, there would be a guide card on which is written the single word "steel." Behind this would be another guide on which is written "steel bars," and immediately following the cards would be arranged according to sizes of steel bars, a card being used for each size.

A separate section of the files should be set aside for supplies. Where it is the custom to manufacture "parts" in advance of immediate requirements, these parts should be placed in store and a section of the files reserved for their record. This is becoming a common practice in factories manufacturing machines composed of many small parts.

(249) FORMS FOR INVENTORY OR STORES RECORD.

The form for the stores ledger card or perpetual inventory necessarily varies in different factories, depending largely on the class of goods manufactured and the materials required. In the following pages we illustrate a variety of forms, among which will be found forms suited to the requirements of almost any factory.

The ledger should in all cases give such general information as name or class of article; size or kind; location in the stores room; high, normal, and low limits; unit and usually the cost. A stock limit should be placed on each article in store and when the supply reaches the low limit a supply should be ordered. The "unit" is intended to show the unit by which the article is issued, such as pounds, dozen, gallon, etc.

Form 6 is a rough stores or raw material record arranged on the loose-leaf plan, one sheet being used for each article and filed in an ordinary loose-leaf binder. Provided proper guide sheets are inserted, there seems no reason why this should not be a very satisfactory plan.

It will be noted that this form provides for a record of quantities, but at the top of the sheet provision is made for a record of quotations and net cost at different dates, so that the value of the quantity on hand at any time is quickly ascertained.

Form 7 illustrates a form in which values as well as quantities are shown. A particular feature of this form is that in the heading the number of the piece or pattern is shown. This is of value in a record of completed parts,

STORES RECORD OF_____

PRICE F.O.B. Date Per Discount

Net Cost At Date Per Add Freight and Cartage

ORDERED							RECEIVED			USED AND ON HAND						
Requisition			For Shop Order or Account	Order		From Whom	Invoice			On Shop Order No. or Account	Quantity in			On Shop Order No. or Account	Quantity in	
Date or No.	Quant. In	Piece No. or Remks.		No.	Date		Date	Quant In	No. of Remks.	Date	Used	On Hand	Date		Used	On Hand
													From 1st Column			

FORM 6.

BOLTS SPIKES NUTS

Location_____ Bin No._____ Maximum Stock Limit_____ Minimum " " _____

Article_____

_____ Piece or Pattern No._____

RECEIVED.							DELIVERED.						
Date		Invoice No.	Shop Order No.	Quantity	Price	Amount	Date		Stores Warrant No.	Quantity	Price	Amount	

FORM 7.

as the number assists in locating the pattern when a supply is required. It really combines the pattern index with the stores record.

We do not consider this, in all respects, an ideal form for the reason that no balance column is provided. When it is desired to ascertain the exact quantity in store, it is necessary to foot both the "Received" and "Delivered" columns.

Forms 8 and 9 could be used in almost any manufacturing business without much alteration. It will be noted that the cost is shown only in the balance column, it not being deemed necessary to record the cost of quantities received and delivered.

The card has a tab on which the name of the article is written, thus the record cards furnish their own index, without the use of separate guide cards.

Form 10 is a very good example of a card index stock record containing all the essential information.

This diagram illustrates very clearly the manner in which the file may be subdivided, a section being reserved for each class of stores and the manner in which the removable metal tab, to which we have referred, is used.

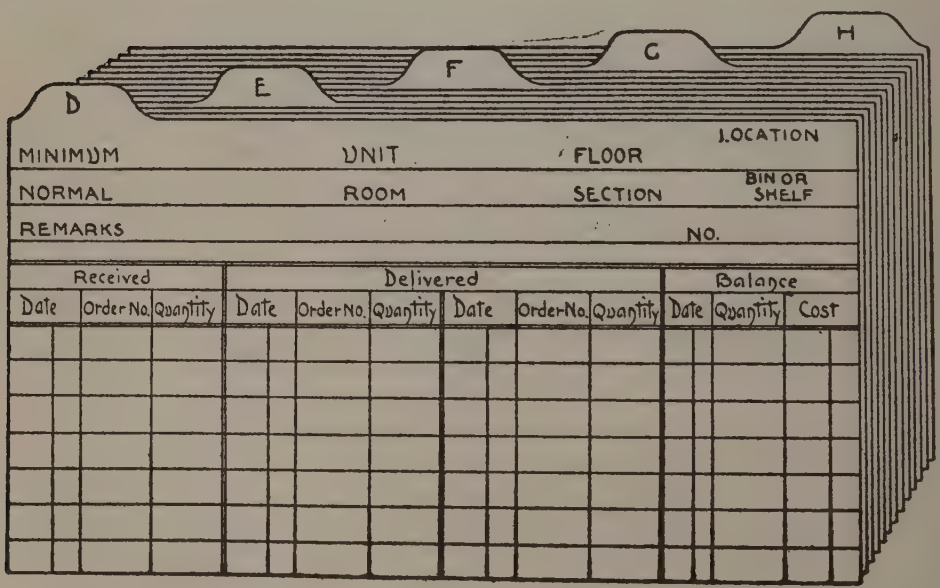
Form 11 is a record of raw materials in the paint and varnish business.

This particular class of material is distinguished by the grade, a card or sheet being used for each grade.

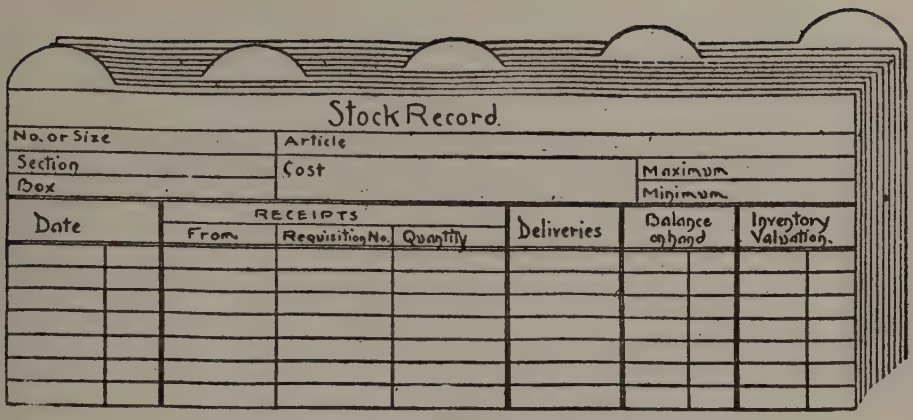
This particular stores ledger is arranged numerically, which is not recommended as a rule for the reason that a separate index is required, necessitating additional work.

Form 12 is a stores record used in a silk mill. Some noticeable features of this form are that it shows from whom the stores were purchased and the name of the person or department whose requisitions for this material have been honored.

A card is used for each invoice, and the heading provides for a record of the price, also the number and amount of invoice. The material received on each invoice is given a lot number.



FORM 8.



Stock Record.

No. or Size | Article

Section | Cost | Maximum

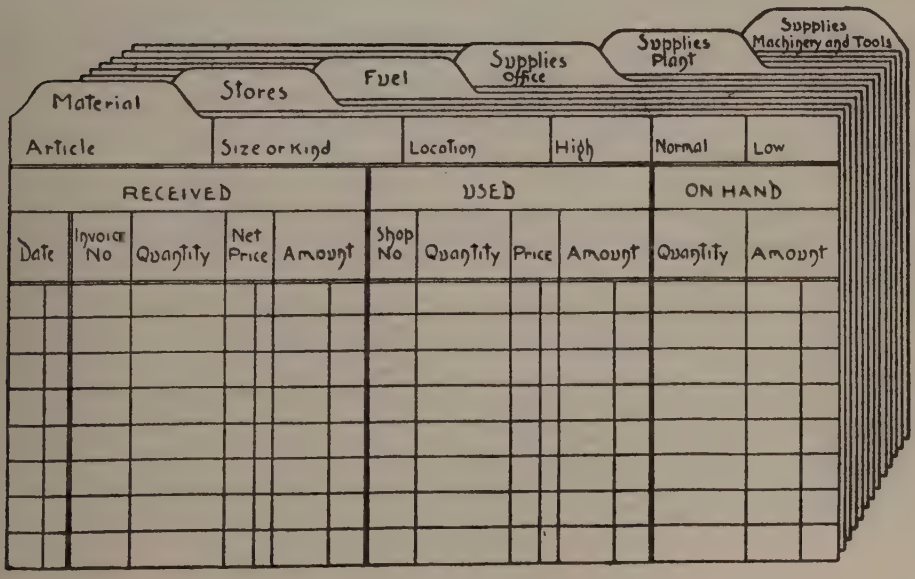
Box | Minimum

Date		RECEIPTS From	Requisition No.	Quantity	Deliveries	Balance on hand		Inventory Valuation.	

FORM 9.

Form 13 exhibits a form on which more particulars relative to each transaction are recorded than is usually the case. Under the heading "receipts" full particulars of the cost are shown, while the "disbursement" columns give detailed information about each lot of material given out.

Form 14 is a tabular inventory sheet to run for twelve months without rewriting names of articles. A factory inventory arranged in this manner undoubtedly exhibits valuable comparative information in a very intelligent manner.

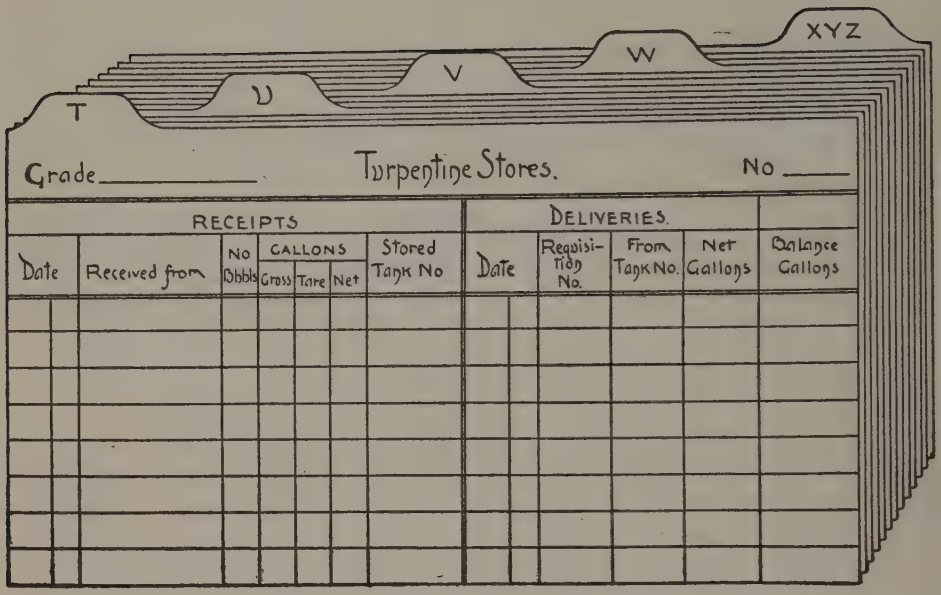


Material | Stores | Fuel | Supplies Office | Supplies Plant | Supplies Machinery and Tools

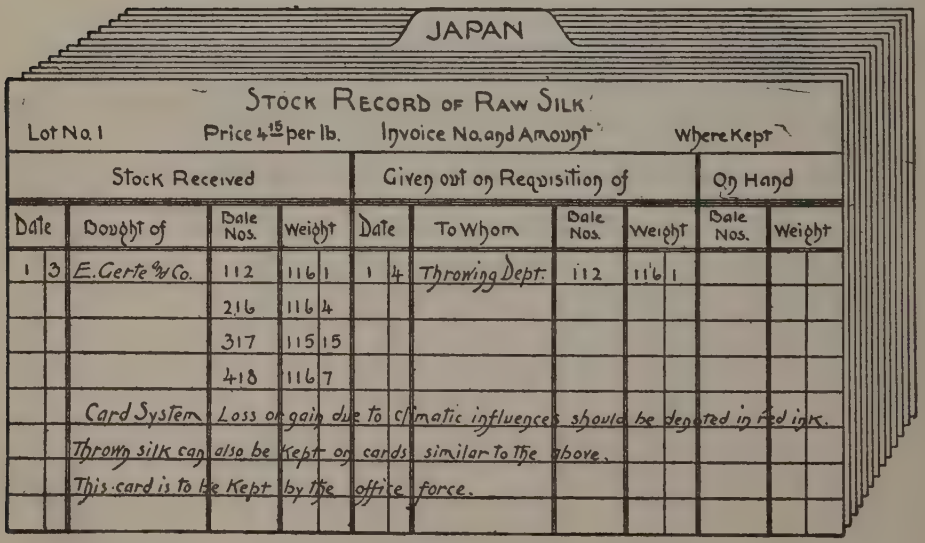
Article | Size or Kind | Location | High | Normal | Low

RECEIVED					USED				ON HAND	
Date	Invoice No	Quantity	Net Price	Amount	Shop No	Quantity	Price	Amount	Quantity	Amount

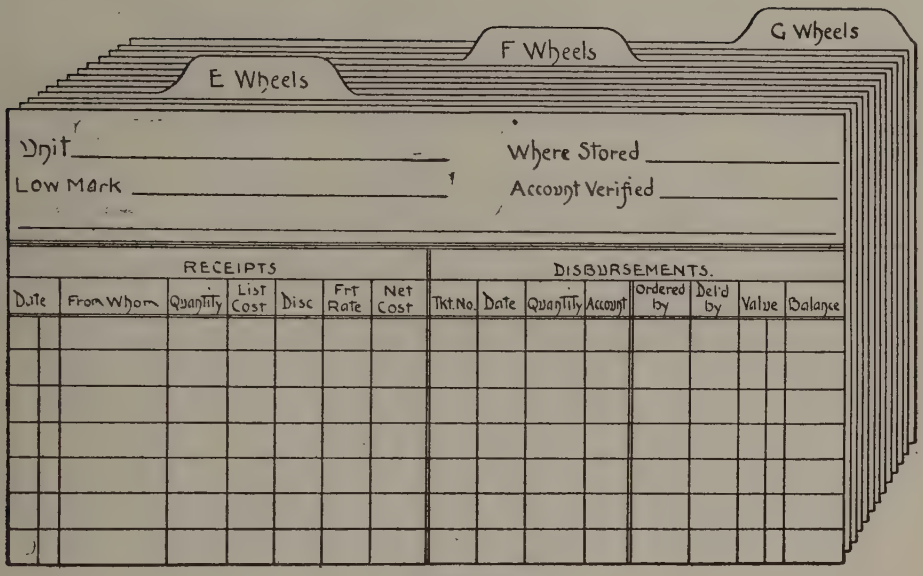
FORM 10.



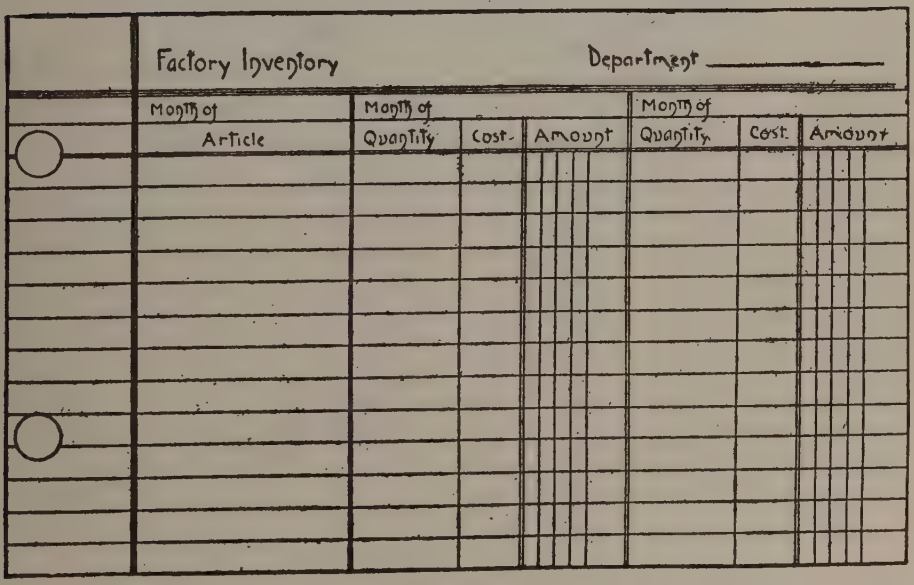
FORM 11.



FORM 12.



FORM 13.



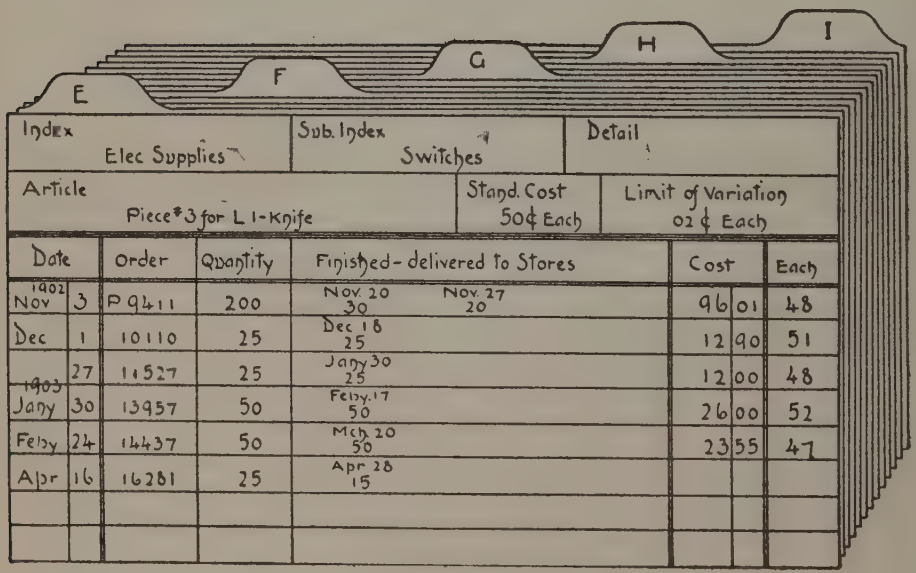
FORM 14.

Form 15 is a manufactured stores index, showing standard unit of cost and comparison of average cost of each order with the standard unit. An interesting feature of this form is that a limit of variation in the cost of each unit is shown. This limit can be established only after a number of orders of varying sizes have been manufactured.

Form 16 is a stores record of rough and finished parts. This card shows the quantity of both rough and finished parts in store and the disposition made of them. Such a form might be very useful in a machine shop where quantities of rough and finished castings are kept in store.

Form 17 is another form of stores record of finished stock. A special feature of this form is that in addition to the record of stock in store it shows just what orders have been placed with the factory or elsewhere and the quantities received and applied on such orders.

Forms 18 and 19 are other examples of stores records indicating different arrangements to meet varying requirements.

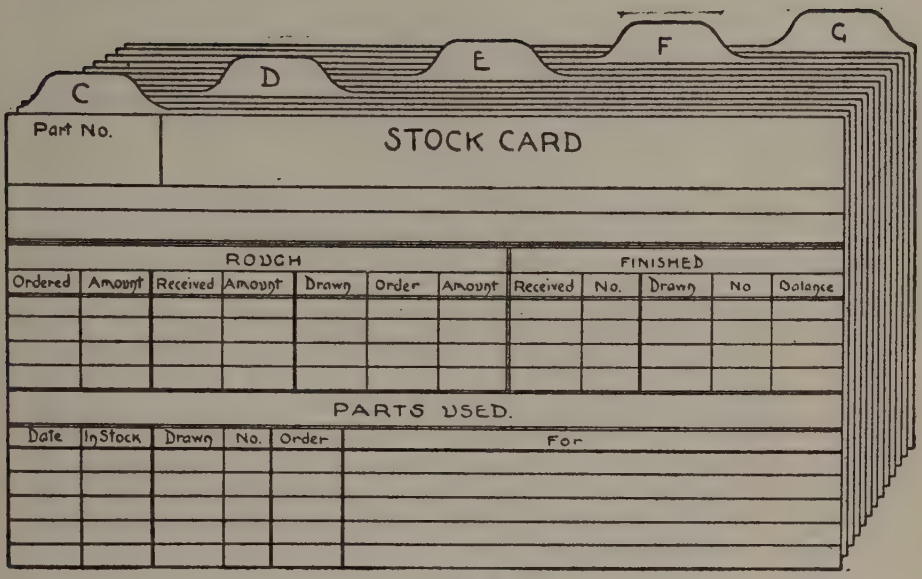


Index		Sub. Index	Detail
Elec Supplies		Switches	

Article	Stand. Cost	Limit of Variation
Piece #3 for L 1-Knife	50¢ Each	02¢ Each

Date		Order	Quantity	Finished - delivered to Stores	Cost		Each
1902 Nov	3	P 9411	200	Nov. 20 30 Nov. 27 20	96	01	48
Dec	1	10110	25	Dec 18 25	12	90	51
	27	11527	25	Jany 30 25	12	00	48
1903 Jany	30	13957	50	Feby. 17 50	26	00	52
Feby	24	14437	50	Mch 20 50	23	55	47
Apr	16	16281	25	Apr 28 15			

FORM 15.


C D E F G

Part No.

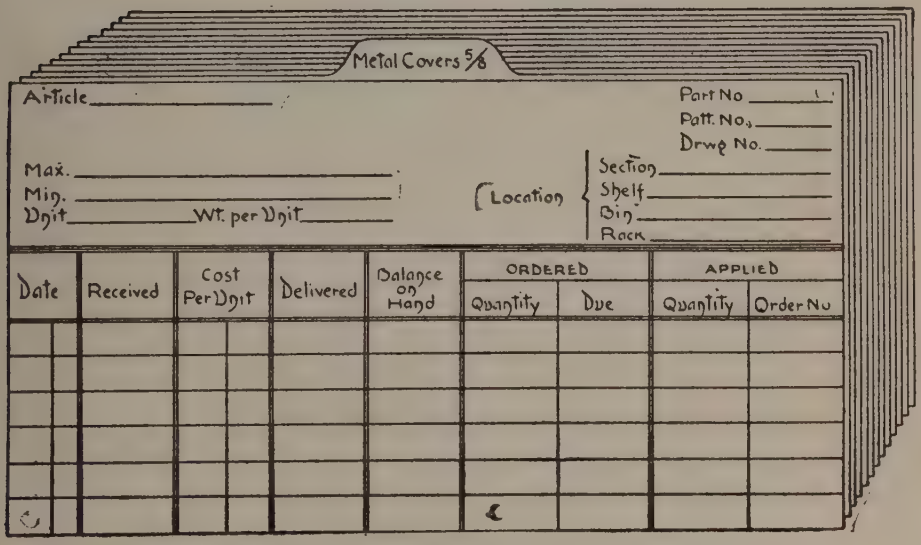
STOCK CARD

ROUGH							FINISHED				
Ordered	Amount	Received	Amount	Drawn	Order	Amount	Received	No.	Drawn	No	Balance

PARTS USED.

Date	In Stock	Drawn	No.	Order	For

FORM 16.


Metal Covers 5/8

Article_____

Part No_____

Patt. No._____

Drwg No._____

Max._____

Min._____

Unit_____ Wt. per Unit_____

Location { Section_____ Shelf_____ Bin_____ Rack_____

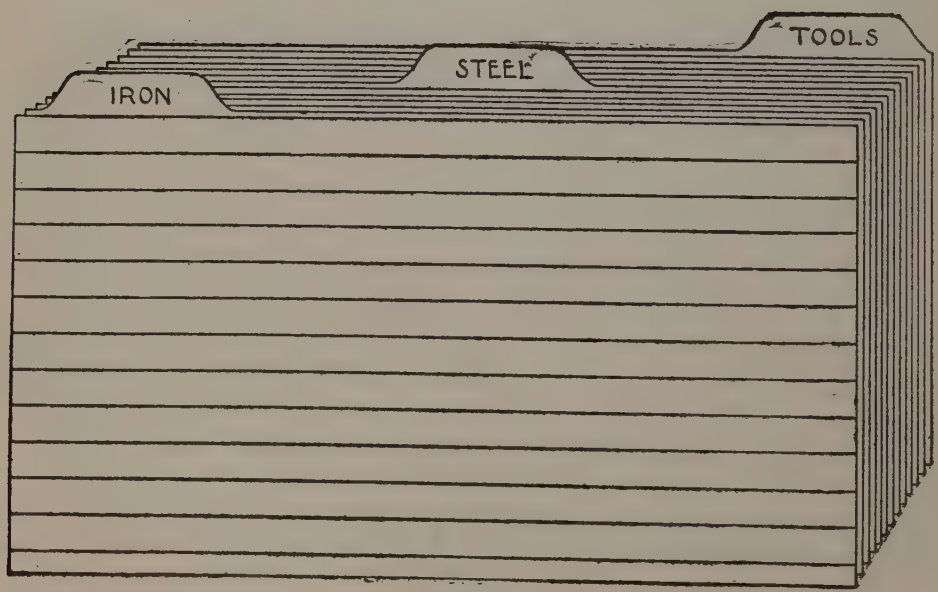
Date	Received	Cost Per Unit	Delivered	Balance on Hand	ORDERED		APPLIED	
					Quantity	Due	Quantity	Order No

FORM 17.

Month	Article	Size or Kind	Unit	Where Stored	High	Normal	Low	

	Received		Delivered			Balance		Dept.	Dept.	Dept.	Dept.
	Quantity	Value	Ord. No.	Quantity	Value	Quantity	Value	A	B	C	D
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
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26											
27											
28											
29											
30											
31											

FORM 18.



FORM 19.

(250) FINISHED STOCK RECORD.

The treatment of finished stock is similar to that described in relation to raw material and supplies, but the stock cards are credited with sales instead of requisitions.

While it is unusual, it sometimes happens that a manufacturing establishment will carry both wholesale and retail departments. For example, in the clothing line. In such cases there should be separate records kept of regular, or reserved stock, and shelf and counter stock, for the retail department. The shelf and counter sales are recapitulated at the end of the day and credited on the stock records in totals.

As an illustration of this class of stock record we present one relating to the retail hat business. The balances under ordinary conditions may be drawn off once a week and inserted in red ink, or with a different colored pencil. See Form 20.

STYLE NUMBER 303		DESCRIPTION Black, Stiff				DIMENSIONS 5¼ × 1⅞				SELLING PRICE 2.50			
BOUGHT FROM Black & Co.		DATE OF ORDER 12/2/04 1/8/05				DATE OF INVOICE 12/30/04 1/10/05				COST 1.75			
Date 1905	Report	Quantity	6½	6⅝	6¾	6⅞	7	7⅛	7¼	7⅜	7½	7⅝	
Jan 3	Rec'd	24		2	4	6	6	4	2				
4	Sold	2					1	1					
5	Bal	22		2	4	6	5	3	2				
7	Sold	6		1		2	2		1				
8	Bal	16		1	4	4	3	3	1				
9	Sold	2			1	1		1					
10	Bal	14		1	3	3	3	2	1				
12	Sold	1						1					
13	Bal	13		1	3	3	3	1	1				
14	Sold	7		1	2	2	1		1				
15	Bal	6			1	1	2	1					
17	Sold	5					1	1					
18	Bal	1			1	1							
19	Rec'd	24		2	4	6	6	4	2				
	Sold	1					1						
20	Bal	24		2	5	7	5	4	2				
21	Rec'd	1			1	Exchange for 308		1					
22	Bal	27		2	6	7	6	5	2				

Hat Stock Record

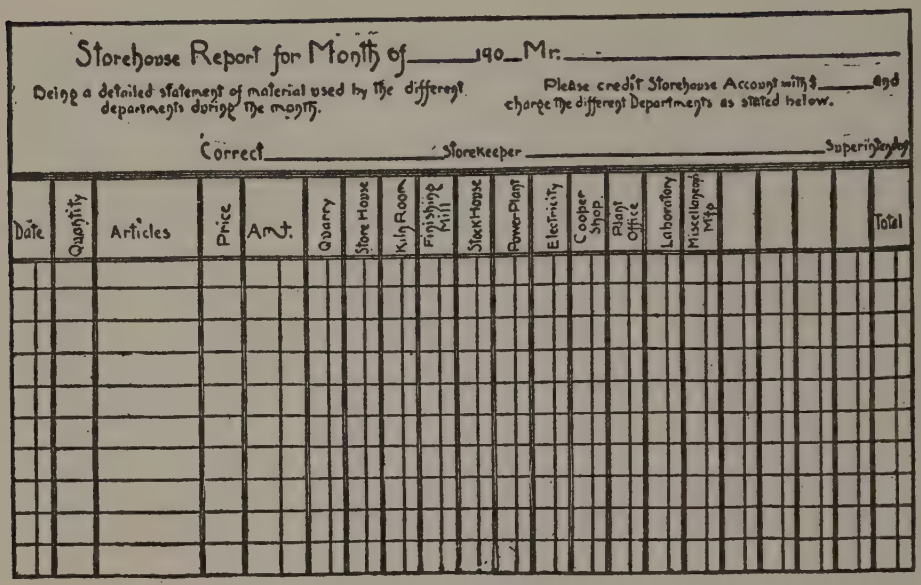
FORM 20.

(251) SUPPLIES STORES RECORDS.

It is often advisable to use an entirely different form for the supplies record. The same supplies will be drawn by several departments and it is often desirable to have a record that shows the quantities drawn by each department.

Forms 18 and 21 are stores records of supplies designed to cover a period of one month. Form 18 shows totals received and delivered each day, the deliveries being charged direct to the departments in which they are used. At the end of the month this record exhibits the total charge to each department.

Where certain goods or supplies are purchased for the exclusive use of a particular department, they may not go into the stores room at all, but will be delivered to the department from the receiving room. In this case a form of report similar to Form 21 may be used by the receiving clerk.



Storehouse Report for Month of _____ 190_ Mr. _____

Please credit Storehouse Account with $_____ and charge the different Departments as stated below.

Being a detailed statement of material used by the different departments during the month.

Correct _____ Storekeeper _____ Superintendent

Date	Quantity	Articles	Price	Amt.	Quarry	Store House	Kiln Room	Finishing Mill	Stock House	Power Plant	Electricity	Cooper Shop	Plant Office	Laboratory	Miscellaneous Mfg					Total

FORM 21.

(252) CHECKING THE STORES RECORD.

It is, of course, necessary to verify the stores records by an actual count of the stores, just as it is necessary to count the cash to verify the figures shown by the cash book. It is not necessary, however, to count all of the items at the same time; in fact, one of the advantages of the stores ledger is that it does away with the dreaded periodical inventory. The stores ledger may be checked by an actual count, taking one item at a time.

One method is to count each item as it approaches the low limit. In this way the entire stock is counted within a reasonable period. Another method which has met with much favor is to call for a count of some item taken at random. This method has the advantage that the stores-keeper never knows what items may be called for, and it has a tendency to make him very careful in his records. Another advantage in counting one item at a time is that any inactive items are sure to be noted and an investigation can be made as to why they are dead or the reasons for their not being used.

If a monthly inventory of the entire stock is desired (and in some cases this seems advisable), it can be provided for by dividing the stores ledger into twenty-six sections and having the items in each section counted on the corresponding day in the month, counting only working days. The divisions are provided by a set of numbered indexes, numbered from 1 to 26, these being entirely independent of the regular alphabetical index and preferably of a different color.

(253) TOOLS AND THEIR CARE.

The care of tools is a matter which in many factories receives too little attention. The amount of capital sunk in expenses and short-lived tools is enormous, so that the interest of economy cannot be better subserved than by the expenditure of time and labor on a most careful record of their use and abuse.

An accurate inventory of tools is of equal importance with the inventory of materials and supplies. While the amount invested in tools at one time may be a comparatively small item, the aggregate is a sum decidedly worth looking after. The manufacturer who has not kept an accurate record of the money so invested will be surprised to learn the amount when he takes an inventory of all the small tools about the factory.

All tools should be placed in charge of some one person and a definite storage place provided for them. In the smaller factories the tools may be in charge of the stores-keeper, while in large plants one or more separate tool rooms, each having a man in charge, may be necessary.

Not alone is a tool room and a proper record of tools of value in keeping track of this property, but it has a good moral effect on the men. A workman knowing that he is to be held strictly accountable for every tool he receives, will be careful not only to return them, but in using them as well.

An inventory of tools is arranged on the same general plan as the inventory of material and supplies. If kept by the regular stores-keeper, a separate section of the files should be set aside for this record. Each tool should be given some distinguishing mark (preferably a number), and this mark stamped on the tool itself. Suppose we have a dozen hammers of a certain size and style, we will assign this hammer No. 150, and the number will be stamped on each of the twelve hammers. The record will, of course, show the number of hammers on hand. In addition, we must have some kind of a record by means of checks or otherwise, showing to whom these hammers are given out. In some shops both records are combined on the inventory cards as per Forms 22 and 23, which also record the ultimate disposition of the tools when no longer in use.

Form 24 is another form of tool record on the same order as previously described.

Form 25 is a record arranged to show the value of new tools purchased each month and is an auxiliary distribution sheet to the purchase record.

In some shops the system followed is to require a workman to make a deposit, or furnish a guarantee for the proper use and return of all tools placed in his care. We quote from a recent writer on the subject as follows:

"Each man as he enters the employ of the shop is provided with an individual kit of tools such as are needed in the department of the shop where he is to work, kits being uniform within a department; he is provided with a drawer, locker, or cupboard, in which to keep these tools, such storage place being convenient to his work, being made preferably of steel netting for ready

TOOLS

Drills

No. 150 — Name and Size: Drills 3/4"

RECEIVED Date			No.	DELIVERED Date		Mags. No.	Ret'd		DESTROYED Date		No.	REMARKS
12	31	03	14	1	2	26	1	16	1	20	2	worn out
2	1	04	12	1	2	27						
				1	16	32						
				2	1	24						

FORM 22.

TOOL CARD

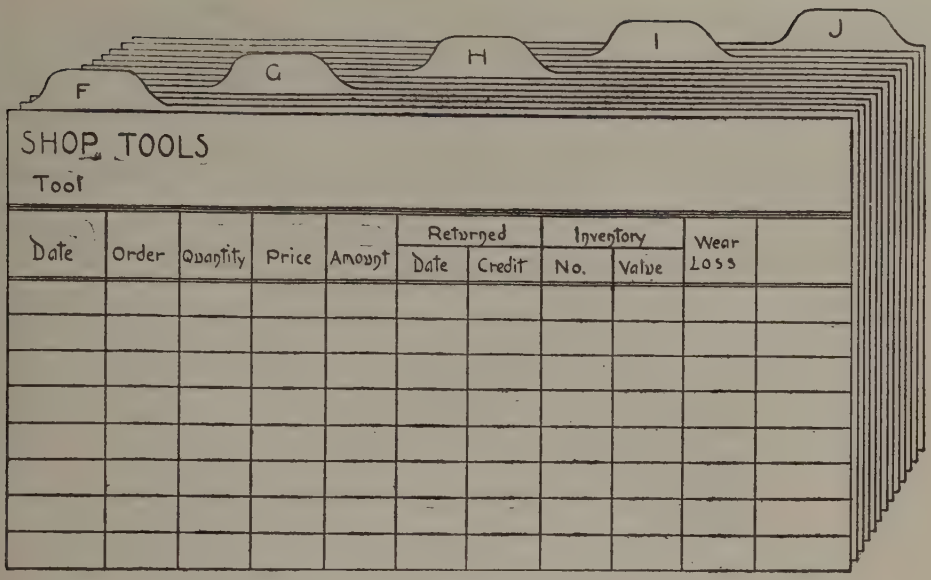
DESCRIPTION

ISSUED TO	ISSUED No	ISSUED Date	IN STOCK No	IN STOCK Date	TOTAL No.	TOTAL Date	RETURNED No.	RETURNED Date	RETURNED No.	RETURNED Date	RETURNED No.	RETURNED Date

FORM 23.

inspection, and being provided with a good lock, of which the tool-room foreman has a master-key or duplicate. For all these, key included, a man signs a printed statement that he will return them or their value on quitting the company's service. It is a great practical convenience to have this form confined to a card not over four by six inches, this last including all the tools that are usually assigned to kits, with blank spaces for extra ones, the tools that are given out in any case being ticked off after each item. It is well also to indicate the cost price of each tool on the face, so that a man may know the extent to which he is liable (See Form 26.)

"In order that no opportunity may be given for the man to claim improper charging, it is well to have the list made out in carbon duplicate of which the man is given the original. This may be conveniently done in the following manner: The cards are blocked in pads (gummed on one edge only, and that at the bottom), and are alternated with printed duplicates of


F G H I J

SHOP TOOLS

Tool

Date	Order	Quantity	Price	Amount	Returned		Inventory		Wear Loss	
					Date	Credit	No.	Value		

FORM 24.

thin paper. Cards and duplicates are serially numbered by machine, the card and its duplicate having the same number. Of these two, the thin paper sheet is the original. A carbon paper is slipped between it and the card and an indelible pencil is used to write the date, number of each kind of tool, names of extra tools, and the man's name at the top of the card where it will be legible and convenient for reference when filed in a case. The tools are ticked

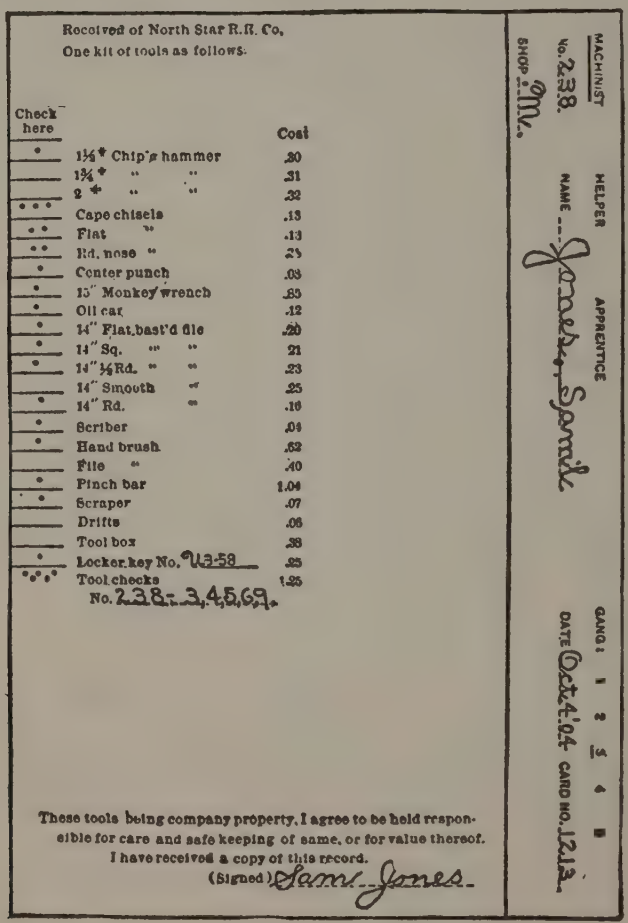
Tools Inventory

Shop No.	Dep. No.	Style of Tools	Value	Additions												Total Value
				Jany	Feby	Mch.	Apr	May	June	July	Aug	Sept	Oct	Nov.	Dec	
3134	5	Pierce Die	91 48													
3135	5	" "	91 47													
3136	21	Mill'g Fixt.			20 00			1 75								
3137	P2	Drill Jig				5 75										
3138	5	Blank'g Die					75 00									
3139	12	Tapp. Fix						3 75								

H-A-II-4

FORM 25.

off by using a sharp-pointed instrument which will perforate the original, thin slip, and yet not go through the duplicate card. The man signs his name in ink to both the original and the card. The original is given over to the man's possession, it being in such shape that he could not readily alter it without detection, and the card duplicate is placed on file in the main tool-room office. When a man leaves, the kit of tools he turns in is compared with his list, deduction being made for what is missing. This record has many ad-



Received of North Star R.R. Co.
One kit of tools as follows.

Check here		Cost
•	1½" Chip'g hammer	.30
	1¾" " "	.31
	2" " "	.32
• • •	Cape chisels	.13
• •	Flat "	.13
• •	Rd. nose "	.25
•	Center punch	.03
•	15" Monkey wrench	.85
•	Oil can	.12
•	14" Flat, bast'd file	.20
•	14" Sq. " "	.21
•	14" ½Rd. " "	.23
	14" Smooth "	.25
•	14" Rd. "	.16
•	Scriber	.04
•	Hand brush	.62
	File "	.40
•	Pinch bar	1.04
• •	Scraper	.07
	Drifts	.06
	Tool box	.38
•	Locker key No. 43-58	.25
• • • •	Tool checks No. 238-3,4,5,6,9.	1.25

These tools being company property, I agree to be held responsible for care and safe keeping of same, or for value thereof.
I have received a copy of this record.
(Signed) Sam'l Jones.

MACHINIST No. 238. SHOP M.
HELPER NAME Jones, Sam'l
APPRENTICE
GANG: 1 2 3 4
DATE Oct 4 04 CARD NO. 1213.

FORM 26.

ditional uses—for instance, as a running inventory of the value of equipment tied up in this way in small tools. On this slip also six to ten tool checks are signed for, the number usually being fixed in a given department. These, of course, are for exchange at the tool-room window for special tools not included in the kit, such as taps, drills, gauges, etc. The checks should not be made as usual of sheet brass cut out and stamped in the shop, but should be made either of brass, or preferably aluminum, imprinted

by a special die with the company's name, and numbered by means of an odd size and shape of steel figure which can not by any chance be duplicated by the shop men. In addition to this, it would be well if all checks were numbered serially on the back. This can be cheaply done by machine if the checks are bought originally from some one of the large concerns making a specialty of them. Of course, a great many blanks (also serially numbered) are bought at the same time to provide for shop increase, and checks that are lost. But the serial number makes possible an absolute record of every check given out, and in connection with a locked tool-room, and the signed slips for tool kits, not only renders the possibility of fraud remote, but also in a very substantial manner reduces the necessary annual investment in small tools. In a locomotive shop employing 1,200 men, where such a system was installed, over $600 per month was saved in money expended for small tools alone, above the expense characterizing the period when such records were not kept.

(254) DESCRIPTION OF TOOL CHECKING METHOD.

Among the numerous tool checking methods in use, the following may be mentioned, some being more suitable under certain conditions than others.

Separate card made each time a tool is drawn, and destroyed when tool is returned.

Book record, in which workman's name and tools drawn are entered, and crossed off when tools are returned.

Slate, the record being erased on return of the tool.

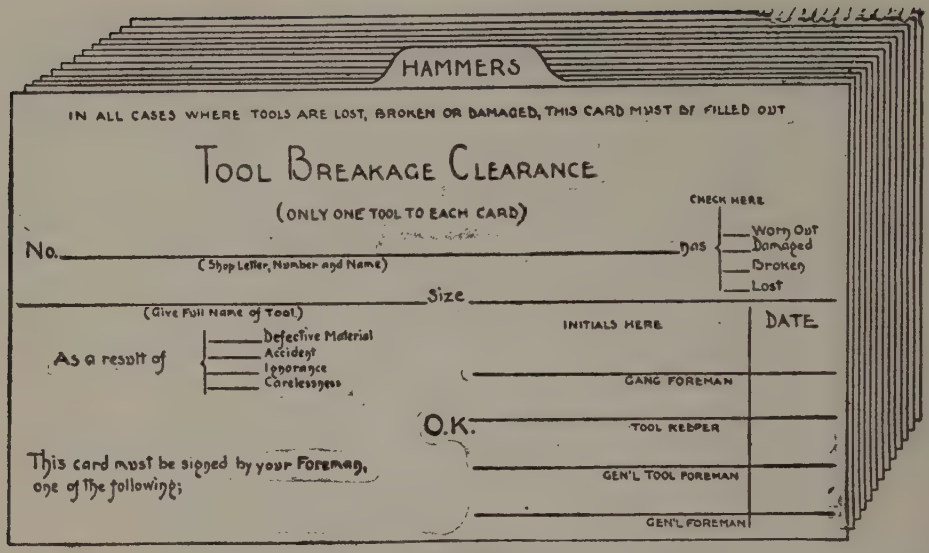
Slate, where each kind of tool is given a separate column, the heading and lines being painted in white. The names of employes drawing tools are entered in the proper columns and erased when tools are returned.

Check system, a certain number of checks being allotted to each man on entering the shop employ, these checks being handed in at the tool-room in exchange for tools and placed on the shelf provided for the tool.

Large boards arranged with hooks or pegs, for each kind or size of tool, checks being attached to hooks when tools are drawn.

Double check system: A board is provided on which hooks are arranged according to the check or clock numbers of the workmen, several brass checks bearing the same number being hung on each hook. For each tool, brass tags bearing the same number as the tool are provided, there being the same number of tags as there are tools. These tags are hung on a hook just below the rack or bin in which the tools are stored. When a workman draws a tool one of his checks is placed on the hook on the tool rack, while the tool check is placed on his hook on the board.

This we consider the most satisfactory of the several methods described. It gives the desired information without the clerical labor on the part of the man in charge of the tool-room. When a man leaves the employ of the concern, a glance at his hook shows just what tools are in his hands, while a glance at the hook on the tool rack shows how many tools are out and who has them.


HAMMERS

IN ALL CASES WHERE TOOLS ARE LOST, BROKEN OR DAMAGED, THIS CARD MUST BE FILLED OUT

TOOL BREAKAGE CLEARANCE

(ONLY ONE TOOL TO EACH CARD)

CHECK HERE

No. _____ (Shop Letter, Number and Name) has ☐ Worn Out ☐ Damaged ☐ Broken ☐ Lost

_____ Size _____

(Give Full Name of Tool)

As a result of ☐ Defective Material ☐ Accident ☐ Ignorance ☐ Carelessness

INITIALS HERE | DATE

_____ GANG FOREMAN

O.K. _____ TOOL KEEPER

This card must be signed by your Foreman, one of the following;

_____ GEN'L TOOL FOREMAN

_____ GEN'L FOREMAN

FORM 27.

Whenever a tool is broken or lost the cause should be carefully investigated.

Form 27 is a form of report to be filled out by the workman, checked up by foreman, and presented with the broken tool at the tool-room window as a voucher for the issue of a new tool. The "clearance" forms are filed for record, and periodically examined by the tool-room foreman.

(255) PATTERN RECORDS.

A convenient record of patterns would necessarily follow in the same line as a record of tools. In some establishments the pattern is known by a number, and in some by a name. In either case, a card index is conveniently arranged on the same general lines as a stores ledger. Cards are more convenient than bound records, because in some instances patterns have a very brief life, while in others the same patterns are used continuously until worn out and new patterns are needed.

Where the numerical system is employed, a separate index becomes necessary to connect the number with the name and purpose of the pattern.

A good plan of record is to use a card sufficiently large so that it will contain the number, description, location, issue and return of pattern, and also a rough sketch of the pattern for ready indentification.

Cards of patterns, in use in shop or foundry, should be kept in a separate file, being transferred to the general file when returned to stock. They should be sectionalized by guide cards under various principal classes, such as machine tools, dies of different kinds, machine parts, etc. These subdivisions or classifications can be extended indefinitely to suit the particular conditions of a business.

The patterns may be kept on shelves arranged in consecutive numerical order, although the use of shelves in this way is not pratical in the case of

large patterns, which must generally be stored in the open room. In the proper shelf section, however, there should be a record of the numbers of patterns to be found outside of the shelves.

(256) WORK IN PROCESS.

We will point out here that at any time a statement of the actual conditions of the factory is required it is necessary to take inventory, not only of stores and supplies, raw material and finished goods, but also of the value of uncompleted work in the shop, comprehending all material and supplies furnished on the various jobs, the labor consumed on them, and also the proper proportion of expense so far incurred.

One good method is to carry a memorandum Work in Process account. To this account is debited all material issued and all labor reported on the various orders in hand. This account is credited with the amount of completed orders. The balance of this account will, therefore, always consist of the value of Work in Process.

Duplicate Shop Orders may be filed in a binder until the work is completed, when they are removed to a Finished Order File, thus the first file is always a record of the work in process and the total of the amounts of materials and labor as shown thereon is the value of the unfinished orders.

The Unfinished Order File constitutes also a cost ledger and an account with each order is carried on the order sheet, and a Cost Ledger Controlling account is kept in the general ledger. From the copies of the requisitions on the stores-keeper for materials, entries are made charging to the various orders, the value of the materials used and crediting the total of such debits to Materials account, so that the balance on Materials account is the value of the materials on hand. From the workmen's time cards each order is charged with the value of the labor consumed, and the total of these debits is credited to Labor account. When an order is completed, the items of material and labor which have been placed on the Order Sheet in the cost ledger by the methods described above, are footed, and an entry made charging to the order the proper proportion for manufacturing expense and for repairs which amounts are credited to their respective accounts. This gives the total cost of manufacture. An amount is then added for profit and the total is charged to the customer and credited to the order account in the cost ledger. The amount added for profit will then show as a credit balance on the order account, and all such balances should be transferred periodically to the profit and loss account.

For making the entries described above, a special ruled journal should be used, having columns on the credit side for Labor, Materials, Manufacturing Expense, Repairs, etc., and a column on the debit side for the Cost Ledger Controlling account. These columns are footed, and posted once a month.

In the above system all expense is carried in one account, as it obviates the necessity of carrying a large number of accounts which is undesirable in a small business, although separate accounts would be advisable for a large con-

cern. A Manufacturing Expense Distribution Book could be kept in which the expense items could be distributed under the heads of Office Expense, Drawing Room Expense, Boxing and Crating, Supplies, etc.

By the method outlined the value of materials on hand is constantly shown by the material account, the value of the unfinished orders by the balance of the open account in the cost ledger, the profit or loss on each job by the account in the cost ledger, the profit or loss on all jobs collectively by the Cost Ledger Controlling account, and the Manufacturing Expense and Repairs accounts show whether or not a proper proportion is being added to orders to cover the factory burden.

(257) DELIVERING STORES.

Under no circumstances should the stores-keeper issue materials without first receiving a requisition signed by some one having authority to make such withdrawals. The requisition should in every case show the purpose for which the materials are to be used. These requisitions should be made in duplicate, one copy being either retained by the person by whom it is signed or sent to the main office for the use of the cost accountant, and the other sent to the stores-keeper. They should also be provided with a form of receipt, so that the stores-keeper's voucher for materials issued may be complete. The cost clerk enters the particulars either on his cost card or Work in Process Record, or holds it until the job is completed and the shop order turned over to him for the assembling and checking of costs. It will be readily seen that if the foreman in charge of the work enters the amount of raw material used on his shop order, a perfect check is obtained on the accuracy of such entries by means of the duplicate requisitions. Transfers of stock from one job to another should be recorded by means of duly authorized transfer slips, the originals being attached to the old job orders as vouchers for the disposition of the stock, and the duplicates being sent to the cost clerk.

It is customary in many businesses to make requisitions on the stores-keeper in triplicate, one copy being retained by the foreman, one copy forming the stores-keeper's voucher, being receipted by party obtaining the goods, and the third copy being forwarded to the office. This third copy is frequently used for the purpose of keeping an independent stores record at the main office, the particulars of purchases being obtained from the invoices as received; the particulars of goods issued to the factory being obtained from the above-mentioned requisitions, and balances extended when required. By this means, and a duplicate time record, a duplicate system of cost accounts is constantly maintained from which the progress on the work each day can be inspected—the material on hand, used, and in process, watched and checked—and the labor generally supervised. This method involves considerable work, but in some factories it has been found worth the trouble, while in others it would, undoubtedly, be entirely unnecessary.

To provide for a proper check on the requisitions, it is usually found most satisfactory to have them numbered. A very good plan is to adopt a series of numbers for each department. The requisitions of one department might be numbered A-1, A-2, etc., while for another department they would be numbered B-1, B-2, etc. In this way, the requisitions from each department are easily distinguished and the stores-keeper can file his copies numerically and by departments at the same time.

We consider this the most satisfactory method of filing requisitions in the office of the stores-keeper for two reasons:

First: All requisitions from the same department will be found in one place, and if the requisition number or department letter is entered on the stores ledger, an individual requisition is more readily located than would be the case if all requisitions were filed in the same place.

Second: The bulk of the requisitions for a given article will come from the same department, and if it becomes necessary to check the records of that particular article, the requisitions are quickly located.

The above applies particularly to requisitions for supplies required in the factory. Requisitions for materials should show the shop order number and must be turned over to the cost clerk.

(258) FORMS OF REQUISITION.

It will be readily understood that for the purposes of a perpetual inventory, it is very necessary to provide for the record of prices and cost of material and supplies on the requisitions made on the stores-keeper. Where it is not desired that actual prices should appear on the requisition and where the cost clerk does not have access to the invoices, code prices are frequently used, these being entered on the requisitions at the main office. The cost clerk has an index to the code, and makes the necessary extensions when he receives the requisitions from the stores-keeper. In most cases, however, the cost clerk has access to the invoices and fills in the prices without the intervention of the main office.

The requisition blank illustrated by Form 28 provides for signatures in the proper manner.

Form 29 is another illustration of requisition or stock check.

Requisition blank, illustrated by Form 30, is a form with a stub, the stub to be retained by the foreman making the requisition. The use of a stub necessitates the unnecessary duplication of work in writing the particulars twice over. The duplicates should be made by means of carbon sheets.

A stores-warrant blank, illustrated by Form 31, is provided with columns for a record of prices and for stores ledger folio, the folio being the number of the card. This particular form of requisition will be referred to later on in connection with the proper use of the improved balance system, which takes as its basis a requisition, or stores warrant, on which the cost of materials and supplies withdrawn from the stores room shall be entered, so that a recapitulation of these requisitions will furnish a perpetual inven-

tory of the value of material and supplies in the shop not accounted for on completed orders.

Form 32 is illustrated as a regular form of requisition to be used where for any reason it is not desirable to enter the prices and values, and Forms 33 and 34 are also sometimes used to advantage.

REQUISITION FOR MATERIAL.

No._____ Date _____

Deliver to_____ Department_____

Description_____

Quantity_____

Taken From _____ Signed_____

Delivered_____ Storekeeper_____ Foreman.

FORM 28.

STOCK CHECK.

Date _____ 190__

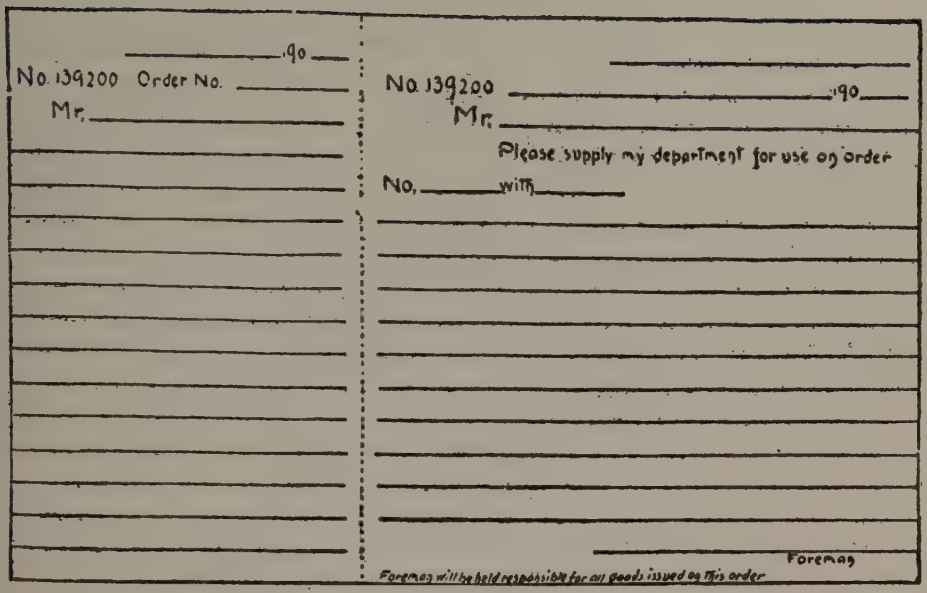
Kind_____

Number_____

(Signatures)

Delivered by Received by

FORM 29.



No. 139200 Order No. _____ 190___
Mr. _____

No. 139200 _____ 190___
Mr. _____
Please supply my department for use on order
No. _____ with _____

_____
Foreman
Foreman will be held responsible for all goods issued on this order

FORM 30.

Stores Warrant No.

Please deliver material as below
To be used for _____ 190___
_____ Order No. _____ _____ Foreman.

Quantity	Description	Weight	Rate	Amount	Stores Ledg Folio

Received by _____ 190___

FORM 31.

Requisition for Supplies. No._____

To_____ Date_____

_____
Storekeeper

Please furnish_____ Department, with the following material._____

Received the above

_____
Foreman.

FORM 32.

Shop No.____ Requisition No.____ Date_____

To Storekeeper Please deliver to _____ Materials as follows

Production			Material Required								
Particulars		Oder No.									

O.K. _____ Foreman

_____ Received by

FORM 33.

No. 6746 Date_____

Please deliver to bearer for use in this department on account of departmental expense order No._____ (cross out the one not used) the following materials:

O.K. Received

_____ _____
Dept. Head.

FORM 34.

EXERCISES.

1. Exemplify general method for keeping account of stock received and its disposition.

2. Draw suitable form of stock record providing for location and minimum, maximum or normal quantities on hand.

3. Explain the reason why it is generally recognized that the card and loose-leaf methods are superior to bound books in keeping records of stores on hand.

4. State how you would treat stores records and disposition of material in a factory using both lumber and iron in the process of manufacture.

5. If the main office desires to maintain a check on the stores-keeper's ledger or records, describe the most efficient method for maintaining such a check.

6. Where a special receiving clerk is employed, explain his connection with the purchasing department, and in what manner his report of goods received should be made.

7. Furnish illustrations of stores records and requisition blanks for stores as used in your business, or in some other business with which you may be more or less familiar. Explain any particular features of same, and why these features are necessary or advantageous in that business.

8. Explain how you would keep account of tools in a manufacturing business, providing for depreciation and replacement of same, as well as location and value.

LESSON IX.

COST ACCOUNTING AND SYSTEMATIZING.

MATERIAL AND LABOR RECORDS; SHOP ORDERS; TIME CARDS; DISTRIBUTION OF PAY-ROLL.

LESSON IX.

Cost Accounting and Systematizing.

(259) MATERIAL AND LABOR RECORDS.

As the cost of production is made up of three elements, Material, Labor and Expense, it necessarily follows that an efficient Cost System must provide for an accurate record of these elements.

In this lesson we propose to discuss the arrangement of Material and Labor Records, leaving the important subject of Factory Expense, Overhead Burden, etc., to be treated in a separate lesson. We illustrate the methods actually employed in a number of manufacturing establishments in different lines, and will define the basic principles that must govern all systems of record of this kind, so that the subscriber may become so conversant with the expedients adopted by others that his own path will be clear and unobstructed.

To ascertain the cost of manufacture, there must be provided an accurate record of the elements of material and time, and there must be a place where these records can be tabulated. Likewise, some authority must be given the superintendent, or foreman, for the manufacture of a given quantity of goods. Since a record is required, oral orders relating to matters of importance should not be recognized, consequently, in the first place, when an order has been received from a customer, or when it has been decided to manufacture a certain quantity of articles for stock, it has been found both desirable and practical to give the superintendent, or foreman, his authority for the work specified in the form of a written order, commonly known as a production or shop order.

(260) PRODUCTION OR SHOP ORDERS.

The Production or Shop Order should be made in duplicate, one copy going to the superintendent of the factory, and the other being retained in the office for reference, as to the progress of the work.

In most factories a certain time limit is attached to each job, and in many cases the factory is required to produce so many parts or so many articles on an order each day. Daily reports of progress are, therefore, made from factory to office and the particulars of these reports are recorded on the copy of the Production Order, thus keeping the general manager of the business in constant touch with the factory output. Where, however, a product must pass through several workshops or departments in the process of completion, or where several parts of the same order are manufactured at the same time in different workshops, the superintendent will issue sub-shop orders to the foremen of these workshops. The different parts are finally assembled in

an assembling room, the records of cost also being assembled from the sub-orders on the original Shop or Production Order.

It is found to be a good plan where sub-orders are issued, to provide them in different colors, for convenience of identification.

The form of the production order will, necessarily, vary in different lines, but in all cases it should furnish full information as to just what is to be made, and how it is to be made. If the goods to be made are standard as to style, material, construction and finish, and are among the regular product of the factory, a symbol or stock number may give the superintendent all necessary information. To illustrate, the order may call for 100 typewriters No. 4. This No. 4 represents a typewriter built according to certain specifications already on file with the superintendent.

When the goods differ in any respect from the standard styles made by the factory, complete specifications should be a part of the production order. These specifications may be written on the order itself or on separate sheets accompanying the order. Suppose the order is for a certain number of pairs of shoes. The shoes are to be manufactured for a jobber who desires certain changes in the specifications of one of the regular styles, making it in effect a special order. It will be necessary to furnish the superintendent with detailed speicfications for that particular order.

The production order is the superintendent's only authority to manufacture a given article or set of articles. The instructions must be complete, as he cannot be held responsible for errors in the specifications.

The production order may call for the manufacture of a certain number of articles to fill an order, or it may be for stock. The quantity may be such as can be completed in a short time, or the order may call for a quantity which

BULLOCK ELECTRIC MFG. CO.

PRODUCTION DEPARTMENT
WORKING ORDER.

Agent's Order No. 120-Cleveland

Customer's Order No. _____ Date 3/21/[illegible] General Order No. 7569

Ship to Iron Trade Review,
Cleveland, Ohio.

Send B-L to above and Cleve. Office.

To be Completed by 5/21/02 Ship via Freight - F.O.B. Cleveland.

One (1) 25 H. P., 220 v., 470 r.p.m., Type N 168
open, shunt wound Motor.
No subbase.
No pulley.
No starting-box.
Make on this order taking parts from "D" orders.

FORM 1.

will require the full capacity of the factory for several months. The latter condition is more likely to exist in a continuous process factory.

A general form of production order, which may easily be changed to meet the requirements of the average factory, is shown in Form 1.

(261) SUB-SHOP ORDERS.

An illustration of a sub-order is shown in Form 2, and these sub-orders are often made up in the form of cards.

BULLOCK ELECTRIC MFG. CO.

SUB-ORDER.

General Order 7569. Date 3/22/

- Punch - Department.

Number of Pieces - 1 -

Operation

Front Head - C. I.

D 1544.

Pattern No. C 1625. Drawing No. 4706.

No. Finished Remarks RUSH.

Foreman

This Slip is to be signed and returned to office when work is completed.

APPROVED.

Estimated time hours. W. H. W.

Asst Supt.

Time taken "

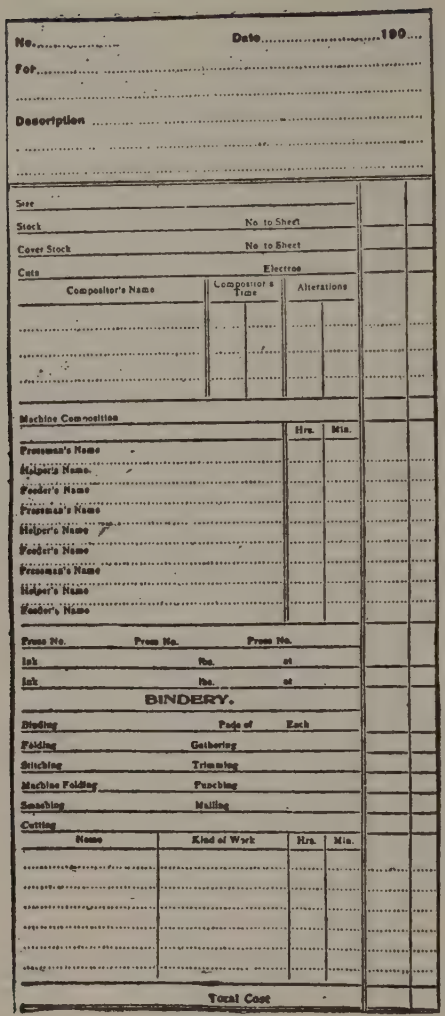
Time saved "

Inspector

FORM 2.

Where different parts of the machine must be manufactured at the same time, the costs from the different sub-orders are afterwards assembled either on the shop order or on a special Cost Card, this depending upon the nature of the business and as to whether it is possible to so arrange the Shop or Production Order as to make it suitable for assembling the costs from sub-orders.

Where it is possible for the original Shop Order to follow the job through the factory from commencement to completion, the Shop Order, of course, constitutes the complete cost record and what is sometimes termed the "Cost Ledger Account." Form 3 shows an example of such a Shop Order used in the printing and publishing business, and in some factories, the workmen's time records are called Sub-shop Orders, but this is usually when certain stock operations are performed in one shop, and the foreman of that shop keeps the necessary records of every one employed in that shop. A Sub-shop Order of this nature is illustrated in Form 4.



No. ..... Date ..... 190....

For .....

.....

Description .....

.....

.....

Size

Stock ..... No. to Sheet

Cover Stock ..... No. to Sheet

Cuts ..... Electros

Compositor's Name	Compositor's Time		Alterations			

Machine Composition

	Hrs.	Min.			
Foreman's Name					
Helper's Name					
Feeder's Name					
Foreman's Name					
Helper's Name					
Feeder's Name					
Foreman's Name					
Helper's Name					
Feeder's Name					

Press No. ..... Press No. ..... Press No. .....

Ink ..... No. ..... at .....

Ink ..... No. ..... at .....

BINDERY.

Binding ..... Page of ..... Each .....

Folding ..... Gathering .....

Stitching ..... Trimming .....

Machine Folding ..... Punching .....

Smashing ..... Mailing .....

Cutting .....

Name	Kind of Work	Hrs.	Min.		

Total Cost

FORM 3.

The shop order usually calls for the execution of certain work within, as nearly as possible, a specified time. That clerical labor may be minimized it is, in nearly all cases, advisable to provide for a tabulation of material, labor and other costs on the shop order itself. The shop order is, in effect, the Factory Ledger account with the particular order to which it refers.

While shop orders should be issued for repairs to machinery or plant, additions, etc., in order to arrive at an accurate record of the cost of maintenance, the shop order with which we are specially concerned in this lesson is the order to manufacture a given quantity of goods. This shop order may be issued for the manufacture of a given number of completed articles, or it may be for the manufacture of a given number of parts which will later be assembled in the completed article.

No. _____

SUB-SHOP ORDER

Foreman A Department _____ Date _____

Execute the following order when Material reaches you

_____ Superintendent

Quantity Received	Articles	No. Turned Out
10000 lbs.	Steel Plates 4X4X1	5000 Hammers
2000 "	" Bars 10x2. R	5000 Axes
	Make this into	
	5000 Hammers Size 2	
	5000 Axes " 1	

LABOR

Workman No.	Hours	Amount	Workman No	Hours	Amount

Date Received _____ Fuel No lbs. _____
" Completed _____ Sand " " _____
Hours in Shop _____ No Machine _____
Machine Hours _____

_____ Foreman.

FORM 4.

(262) FACTORY CLASSIFICATION.

At this point further reference to the different classes of factories is appropriate, and for convenience we place all factories in two general groups which we term Continuous Process and Special Order factories.

(263) CONTINUOUS PROCESS FACTORIES.

In the first group we place those factories manufacturing staple lines of goods which are sold from stock. This class includes nail mills, textile mills and similar lines, and the shop order is issued to manufacture a given quantity of goods for stock, or to convert a given quantity of raw material into the finished article. Take, for example, an establishment where buttons, pins or similar articles are manufactured, and it will be found that the cost problems are by no means complicated.

The shop order should contain a list of the various operations, so arranged as to provide a continuous record of machine and man hours employed. A button of a certain size and shape should always closely approximate the established standard, and the cost of special dies will, of course, be charged against the cost of the job for which they are used.

We will deal with the subject of machine cost later on, particularly in relation to factories where the greater part of the work is performed automatically by machinery, but in a factory manufacturing stock articles, shop orders may be arranged to show how the standard cost per unit is obtained and these are of considerable value in maintaining the efficiency of the workmen in producing the completed article at the lowest possible cost.

(264) STANDARD UNITS.

	TO FILL ORDER No.	FACTORY ORDER Date 1/4/5 Description of Article	ORDER No. 4216
	QUANTITY 500	Regular Finish.	STOCK ARTICLE No. 859
			TOTAL COST .8430 Each.

		Material	Cost $	Cts.	Labor	Price	Time H.	M.	Cost $	Cts.
	—		2	1164	72	27½	3	45	1	0312
	—		3	2750	16	30	12	15	3	6750
	—		6	1520	41	28	14		3	92
	—		4	0000	26	29	17	30	5	07
	—		3	1975	114	27½	10	15	2	8187
	—			6750	146	10	16	45	1	6450
			19	4159					18	1599
		10% waste	1	9415	14½% lost time				2	6331
		Total Material	21	3574					20	7930
		" Labor	20	7930						
		500	42	1504	8430					

FORM 5.

Form 5 shows how the standard may be obtained. The provision for waste is undoubtedly reasonable, but it would seem that no such percentage of lost time (not including indirect labor) should be permitted.

Considerable confusion is avoided and the cost of production is influenced quite largely by the adoption of standard units, and when standard sizes are adopted, these also have a very material bearing on the economical use of raw material. As an illustration, when you submit a new blank to your printer, he always suggests certain standard sizes, not because he cannot give you some other size, but because his paper cuts to those sizes with the least waste. The reduction of cost records to units is, therefore, of the utmost importance as it affords a reliable comparison between one workman and another, as well as between one order and another, and instantly detects variations, and leads directly to their cause.

In dealing with stores, the value of which is affected by market conditions, it is very desirable to not only enter values on the stores record, but also to extend the units of cost of material so that when one lot at a certain price has been issued to the factory, the next lot, purchased at an increased price, will be charged to the job at the proper rate, and not at the price of the preceding lot.

The methods by which these units are established naturally vary greatly in different classes of business, and are applied not only to figures in connection with actual costs, but also to all kinds of statistics, as, for example, the quantity of ore extracted, per ton mined, etc.

(265) SPECIAL ORDER FACTORIES.

The second group, known as special order factories, includes those factories in which the goods are finished only as required to fill customers' orders. Certain classes of factories manufacture the goods entire from the raw material to fill each order as received. Others manufacture parts for stock and assemble these parts in the completed article on customers' orders. Still another class make the incomplete article for stock and finish the article according to the desire of the customer. This is true of knitting mills where certain styles of garments are knit, but trimmed according to specifications furnished by the customer. Shop orders, in such factories, are issued for the completion of the goods called for by the order of the customer.

(266) VARIATIONS OF METHOD.

To meet the requirements of the multitude of factories in many different lines, the form and method of handling the shop order is subject to great variation. To give examples of shop orders to meet the requirements of all factories would require many times the space available, but as indicated in the introductory paragraphs, we will now illustrate a sufficient variety of forms to enable the student, by combining the ideas found in two or more examples, to devise a form well suited to the needs of his particular factory. We will first take a small establishment and work upward to enterprises of larger magnitude.

(267) SMALL MACHINE SHOP.

Some machine shops deal principally with bases, castings and small parts necessary for the assembling of special machines. They also send men out to make repairs. It is a comparatively easy matter in cases of this kind

RANSOM, BUHL & Co
DETROIT, MICH.
ORDER SHEET.

Order No. _____ Date _____
Customer's Order No. _____ (Quote on bill)
From _____
Address _____ REPAIRS
When promised _____ When delivered _____

Material and Supplies used
Time occupied
Total Cost
Profit

FORM 6.

to make a shop order serve the purpose of both Cost Ledger account and bill to customer as indicated by Form 6, which is made in duplicate.

The original is retained in the office and the duplicate handed to the foreman. When the job is completed, the foreman turns the duplicate into the office with particulars entered thereon of material used and time occupied. The original is then used for the customer's bill, the cost record portion being detachable by perforation.

STOCK CUTTER

Accurately count and record in Board feet or in Lineal ft so specified, inside this sheet all stock used on this order

List of Stock Sawed Sizes.

24 Stiles 2-7x2 1/8 x 1 1/2
20 " 2-11x " "
4 " 2-5x " "
24 Rails 3-11x2 3/16x "
5 " 2-9x2 1/8 x "
5 " " x 3 1/8 x "
4 " " x 2 11/16 x "
24 Bars 2-5x 7/8 x "
20 " 2-9x " "
4 " 2-5x " "
102 Muntins 1-0x " "
5 Sets Rails 1-9x2x 1/2 & 1 1/4

Order No. 1184 Door 16 Page 76

Date May 6 1905

For Whitney Bros.

Delivered Easthampton Mass.

Description of Work

2 Sash 30x26 1 1/2 6 lts
5 Windows 2-8 2 5-5 1/2 1 1/2 18 lts
2 Rough Sash 2 1/2 d.a 1 1/2 6 lts
2 Sash 2-11 2 x 2-4 1 1/2 6 lts
They pay freight
2822
D7197

E N
Delivered May 19-05
B E R Shipper

We Respectfully Recommend.

Subject

Date

Inv.

FORM 7. OUTSIDE OF FOLDER.

Date		Name	Hours of Labor				Amount of Stock Furnished								
			Bench	Machine	Rate	Amount	Mouldings	Lineal Ft.		Amount	Kind of Lumber	Amt in Board Ft	Cost	Amount	
May	11	Felix ✓		2 3/4	20¢		45	Staff Mldg.				Spruce Clear				
"	"	Robbins ✓	1/2		30		15	Fitting Bds				Spruce No. 1				
"	2	Macomber		1/2	"		15	Blind Stops				Spruce No. 2				
"	"	Meyers ✓		4	25		1 00	Lip Caps				Pine 4 in.				
"	"	Robbins ✓		6 1/2	30		1 95					Pine 3 in.				
"	"	Welch ✓	1 3/4		25		69	Cramp Mldg				Pine 2 1/2 in.				
												Pine 2 in.				
								Bed Mldg				Pine 1 1/2 in	70 ft. Native	20	1	40
												Pine 1 1/8 in	Labor		7	65
								Door Mldg				Pine 1 in.				
												Pine 1/2 in.				
												W Wood				
								Mouldings				Cypress				
		Bressenham ✓	5 3/4		30	1	73									
		Indirect Labor				6	12					Sycamore				
		Add 25%				1	53									
						7	65	Nails				Maple				
								Pulleys				Rift Oak				
								Screws								
								Paint	1 Gal			Plain Oak				50
								Glue	25 lbs. 2¢							50
								Putty								
								Screen				Ash				
								Special				Birch				
												Cherry				
								Glass	72 ID. 11x14 = 5¢			B Walnut			3	00
									126 - 102 12 = 3 1/2			Mahogany			4	41
												Chestnut			1	06
													Factory Exp. add 25%		4	52
													Cost		23	38
												Carriages etc.	Profit Add 25%		5	65
													Sell		29	23

FORM 7. INSIDE OF FOLDER.

(268) SASH AND DOOR BUSINESS.

In a small sash and door business a very complete shop order is used, sample of which we illustrate in Form 7.

This shop order is in the shape of a folder. On the outside are particulars of the customer's order in one column, and the record of lumber sawed to furnish the necessary material. On the inside is printed a full list of every description of lumber used, and also mouldings and necessary supplies.

The time occupied on the various operations is listed in one column, and the value of the material used is entered against the respective headings. Twenty-five per cent. is added for factory expense, including machine cost, and another twenty-five per cent. added for profit.

It is a difficult matter to ascertain the actual cost of glue, paint, putty,

RECORD OF MATERIAL AND TIME.

On S.O.#_____ Dz#_____ Chairs

Back Posts_____ Cost_____
Front " _____ " _____
Stretchers _____ " _____
Back Rounds_____ " _____
Seats_____ " _____
Time Setting up_____ " _____
Total _____

_____ Foreman Shop _____

Gals. Filler used_____ Cost_____
" Varnish " _____ " _____
Time Varnishing_____ " _____
Total _____

_____ Foreman Varnishing Department

Total Cost Material _____
" " Labor _____
" " Material and Labor _____

_____ General Foreman

Date _____

FORM 8.

and supplies of that kind used on particular jobs, so that it is customary to estimate these, according to the size of the job. In this business the waste from cutting is usually sold for firewood, or used as fuel, but the value of this waste should be credited to the job.

(269) CHAIR MANUFACTURING BUSINESS.

In the chair manufacturing business a similar principle, as illustrated in the sash and door paragraph, is adopted, as shown in Form 8, the different operations being specified, and the cost of material, supplies, and time occupied carefully recorded.

(270) WOOD-WORK BUSINESS.

In a carriage spoke manufacturing business the material used is exclusively hardwood. The following operations are necessary to record:

1. Sawing rough timbers into strips about the required size, and sorting of these into several different grades, which will be done by an experienced workman in saw room.

2. Shaping of these rough pieces into crude spokes with round or elliptical sections.

3. Trimming off ends of spoke, one to fit the hub, the other to fit the rim.

4. Sanding and general cleaning up to make the finished article.

Three items enter into the cost finding, viz.: 1. Raw Material; 2. Labor; 3, Expense; and as the shop order can follow the job through the different operations, the statistics will all be entered on the original shop order.

This is a case in which the cost of machine hours in sawing spokes would have to be ascertained, and the cost of waste also enters into the manufacture of these articles.

The same conditions apply to factories where the entire wheels are manufactured. The work is almost exclusively performed by machinery, including the bending of the rims.

Size_____ No. Col._____ Style_____ Kind_____

Items	Cost		Comparison	
Iron			Per lb.	
Other Matl.				
Shaking out				
Cleaning			Per foot	
Testing				
Finishing				
Assembling			Whole Cost	
Pct. Genl. Expense				
Sundry				
Cost per section				
Cost per foot				
No. lbs. to ft.				
Cost per lb.				
Remarks				

FORM 9.

(271) RADIATOR MANUFACTURING BUSINESS.

Form 9 shows a style of shop order used in the radiator business for recording separate costs for each style and kind of radiator manufactured. This shop order shows the various operations it is necessary to record.

(272) ELECTRIC SIGN MANUFACTURING BUSINESS.

In the electric sign manufacturing business it is necessary to provide for a considerable amount of information so that nothing may be overlooked, however small, in charging out the cost. It will be noticed that the instructions, therefore, are in great detail. See Form 10.

METAL ELECTRIC SIGN MANUFACTURING.

SHOP ORDER

Date_____ Order No._____

Size of sign_____ feet long by_____ feet wide

Double Vertical

Single Horizontal

Frame { Raised / Plain / Ornamental

Ornaments No._____

Inscription on Sign

_____

Letters Raised Grooved

Height of letters _____

Number of sockets to height of letter_____

Kind of sockets to be used_____

Painting and Finishing

Letters: Side in_____ Face in_____

Back ground in____ Smalts With or Without Ornaments

Date to be completed_____

Ordered by_____

Ship to_____ Via_____

Inspected Painting_____

Electrical work_____

Special Remarks

_____

FORM 10.

The actual cost of material and labor is entered on the reverse side of this card.

(273) LEATHER MANUFACTURING BUSINESS.

In the leather manufacturing business, the operations may be described as follows:

The hides are first sent to the shop provided for removing the hair and flesh, after which they go to the shop where they are softened and cleansed, preparatory to applying bark and other chemicals.

The hides then go to the shop where the bark and chemicals are applied.

Lastly, the hides pass through the shop for rolling, after which they are ready for the sales-room, or market. The time employed on these various operations is assembled on the shop order.

(274) WIRE FENCE MANUFACTURING BUSINESS.

Form 11 illustrates a shop order used in the wire fence business where

Shop Order #_____

Date_____ When Wanted_____

Quantity or No of Article_____

Material		
C		
C		
C		
Total Cost of Material		
Labor		
Employee hr. Rate		
C		
C		
C		
C		
C		
C		
C		
C		
C		
C		
C		
Total Cost of Labor		
Total Prime Cost		

FORM 11.

standards are established for so many hundred yards of fence of different heights. In the particular case referred to, it will be seen that the time of a number of employes working on the same order is assembled on the shop order, the wire fence being made by piece work. The other charges, viz., indirect labor and factory expense, are added at the foot of the shop order, which completes the record of prime cost.

In this business a separate cost account is carried with each different height of fence. The particulars, therefore, will show the number of rods, weight, and cost of each quantity of each kind, thus furnishing a comparison of great value, both in regard to the cost of direct labor, and the machine cost.

(275) TOOL CONSTRUCTION.

The next shop order relates to the construction of tools and contains particulars as to specifications and drawings from which the tools are made.

Order No. 3134	For Department 5	Account Tool Construction.	Date Issued November 24, 1903

To Mr F. Johnson Department No. 7.

Please execute the following order and carefully charge all material and labor to the above order number:

Make two piercing dies for left carriage end D-203

Drawing C-456-457

Quantity Finished 2 Date Completed February 4. 1904

Approved I. Lewis, Superintendent Foreman F. Johnson

This order must be approved before commencing the work

FORM 12.

A somewhat similar example may be indicated in the manufacture of chisels, and tools of that kind. In this case, the steel should be kept in stock as near as possible in lengths adapted to the tools to be made. If a tool requires a bar of steel 5 ft. 6 in. long, and a bar of steel 8 ft. long is delivered to the workman, it is very necessary to see that the 2 ft. 6 in. over-supply is accounted for. It should also be the stores-keeper's duty to see that the bars of steel delivered can be cut to proper advantage, and without waste.

(276) METAL MANUFACTURING BUSINESS.

This form relates to a business where the material used is very valuable, such as brass, and where the odds and ends and scraps can be re-melted. In a business of this kind, it was recently discovered that, on account of not possessing a proper system of accounting for these scraps and odds and ends, it was being sold by the carload by dishonest employes. Not only so, but in the scrap heap would be found quantities of uncompleted parts, showing that these parts were deliberately abstracted for the purpose of being sold in this way. This shows the absolute necessity for an efficient method of keeping track of stores of all kinds. The employment of a special storeskeeper in this particular case would undoubtedly have saved thousands of dollars.

SHOP ORDER NO.

MATERIAL					SALVAGE		LABOR		MAT'L	
Hrs.	Mch. No.	Clock No.	@							

FORM 13.

In establishments where extensive work is executed, such as ships, engines, etc., a certain time is frequently noted on the shop order as the estimated date when the work will be completed. A duplicate of the shop order is to be retained in the president's (or other responsible officer's) desk, and daily reports of the progress of the work are turned in by the superintendent of the factory, and notations made accordingly on the shop order, thus enabling the official concerned to keep an intelligent watch on the progress of the work.

(277) TRANSFERS.

The materials required in many factories are of such a nature that it is practically impossible for the stock-keeper to issue the exact quantity required on a given shop order. A certain part of the material will not be used, and this should be credited so that the order will be charged with only the material actually used.

As an illustration, we will take a furniture factory or other wood-working plant. An order is issued to make a certain number of articles. The foreman will make a requisition for the lumber, calling for the amount required as nearly as it is possible to figure in advance. When the lumber is cut, a certain quantity is left over; perhaps pieces which, while too small to use on that particular article, can be used for some other purpose. This lumber should be returned to stock. Perhaps it will not actually be sent to the stock-room, as there may be another order in process to which it can be transferred. To insure proper credit for material returned to the stock-room, the foreman should obtain a receipt from the stock-keeper. A suitable form is illustrated.

TRANSFER CARD. Date _____

The following materials received on S.O No _____ have been transferred to S.O No. _____

_____ Foreman.

FORM 14.

The material, or stores, having been received in the factory from the stores-keeper, it is frequently found desirable to transfer a portion from one job to another. For this purpose, it is customary to use a transfer-card in duplicate, one copy going to the stores-keeper so that he can make the necessary corrections on the stores record.

(278) INDIVIDUAL OPERATOR'S MATERIAL RECORDS.

Where a certain amount of material is used for a certain job on which a number of workmen operate collectively, it is unnecessary to duplicate a record of quantities on the operators' time-cards. Where, however, a certain quantity of material is given to each operator, it is necessary to provide on the operator's time-card a record of the material handled by him.

(279) TIME RECORDS.

The record of costs contains two principal elements—the record of materials used and the record of time employed. Estimates have no place in the cost system, therefore provision should be made for an accurate record of the time of each workman employed on a given job.

(280) INDIVIDUAL TIME CARDS.

Many different plans have been advanced for obtaining a record of the time of each man, but the most satisfactory and only practical plan is to furnish individual time cards or tickets to each workman and require a record of the time worked on each separate job. One very important point in connection with time records for each job is that the total of the time employed on each separate job should agree with the time for which the workman is paid. In other words, the workman should be required to account for all the time employed, and this rule can only be enforced by basing his pay on the time shown by his time card, regardless of the time shown by the time clock.

A method employed in some factories is to furnish the workman with one time card for the day and depend upon him to record the time employed on each job or order. We do not favor this plan for the reason that it opens too many possibilities of error. Naturally the workman will follow instructions and account for all of his time, but he is not liable to be over-particular to furnish an exact record for each job on which he may be working. In many cases where this plan is in operation, a workman will fill out his time card at the close of the day, estimating the time employed on each job, and caring little about the accuracy of the record, so long as his card shows a full day.

A much better plan is to furnish the workman with a time card for each separate job on which he works during the day, requiring him to turn in his card to the foreman on completion of a job before receiving a new one. Let us see what effect this has on both the workman and the foreman. The

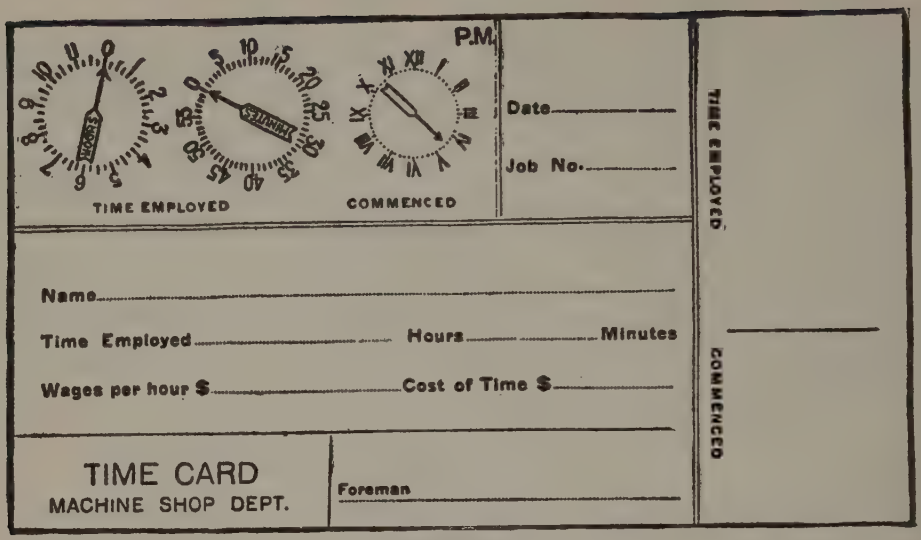
workman knows that he will be paid only for the time shown by his cards, therefore, when he turns in his card on completion of a job, he will insist on receiving another card from the foreman. If the foreman fails to have another job ready, he will be obliged to issue the workman a non-productive card, representing so much lost time, as he cannot ask the workman to lose the time. The workman is not likely to consent to add his lost time to the next job, since he knows that a careful record of his work is being kept and any noticeable increase in the time employed on a given job will reflect on him. The foreman knows that he cannot afford to have an unusual amount of non-productive labor charged against his department, consequently he will so plan his work that each workman will be supplied with direct or productive work at all times.

The forms of time cards used are many, and we give a number of examples. One point which should be considered in preparing a form of time card for any business is to make the recording of time easy for the workman. While it is true that in these days we rarely find workmen so illiterate that they cannot make a distinct record of the time employed on a job, it is hardly just to expect the ordinary mechanic to make neat and accurate records. Save him all the clerical work possible; have his time card filled out, showing his number and the shop order number before it is given to him; and arrange the card so that he can record his time either with a punch or by means of a check mark, or, better still, have the record made by means of a mechanical time recording device. Do not require him to compute the time on each job, but merely indicate the starting and quitting time, leaving the computation for the time-keeper or cost-keeper.

(281) MECHANICAL TIME RECORDING DEVICES.

By far the most satisfactory plan is to use a time recording device. Factories are numerous where the time clock, used to record the time of arrival and departure of the workmen, can also be used to record the time on individual time cards, but if only one clock is used, it is often too far from the workmen to make it practical. A time recorder should be provided for each shop.





FORM 15.

One very satisfactory device is the ordinary time stamp. If the stamp is kept by the foreman, he can stamp the cards as he issues them and again when they are returned, resulting in a record of the starting and quitting time of each workman on each separate job.

Another very practical device is the machine known as the Calculagraph. We illustrate both the machine and a time card showing the form of record made. The great advantage claimed for this machine is that it records the elapsed time, but the same is true of other time recorders. When the foreman issues a card to the workman, he inserts it in the machine, and by the operation of a lever registers the starting time. As soon as the job is completed, the card is again placed in the machine and the operation of another lever registers the exact time which has elapsed since the card was first registered.

As above stated, one very important point to be remembered in connection with the time record as applied to the cost system is that the individual time cards should account for all of the time for which the workman is paid. This is a serious defect in many cost systems. A record is kept of the time spent on each job, but if compared with the pay-roll record a discrepancy is found, proving conclusively that there has been lost time or that no record has been kept of the time spent on indirect labor. The workman should be given to understand that a correct record is absolutely necessary and that a record of his work is being kept in the office. When he completes one job he will check the time on his card and unless he has already been provided with work, he will go to the foreman and ask for a new card, which is his order for work. If the foreman has neglected to provide work for him, it will be necessary to issue an indirect labor card, as the workman will insist on having some kind of a record, knowing that he will be paid only for the time shown on the cards.

The records obtained from the time cards also furnish a most efficient check on the genuineness and accuracy of the pay-roll. The latter should be made up independently, either from the time clock, or time-keeper's records, and a recapitulation from the time cards agreed with it. This will immediately prove, on the one hand, that every minute of the time of each workman has been accounted for—and on the other hand—that all the workmen whose names appear on the pay-roll have actually been employed in the factory.

As a general principle, the proper handling of factory time records includes—

A separate record by each workman,

A recapitulation or assembling of the time of different workmen on the shop order,

A distribution of the pay-roll and a comparison with the time clock.

One time card illustrated shows that the time for the entire day is divided into ten-minute periods. The workman is expected to indicate the starting and quitting time by checking the numbers or by punching the card with an ordinary hand punch. See Form 16.

Name _____ Shop Order # _____
No. _____ Glass Works
Date _____ 190__

6	10	20	30	40	50	1	10	20	30	40	50	Total Time
7	10	20	30	40	50	2	10	20	30	40	50	
8	10	20	30	40	50	3	10	20	30	40	50	Rate / Amt
9	10	20	30	40	50	4	10	20	30	40	50	
10	10	20	30	40	50	5	10	20	30	40	50	Over Time
11	10	20	30	40	50	6	10	20	30	40	50	Rate / Amt
12	10	20	30	40	50	7	10	20	30	40	50	
												Extras

FORM 16.

Another card illustrated is a good standard form, where the workman is expected to make his own records, same afterwards being O. K.'d by the foreman, and the daily time card illustrated is subject to the objection previously made where one time card is used for the entire day's record.

Time Card	All Workmen are Engaged by the Hour		
Shop Order No.	Drawing No.	Piece No.	This Column To Be Filled In By H M C Office
Operation	Dept.	Machine No.	MONEY VALUE
Workman's Number	Date	Hours	Quarters
Workman's Name			
Remarks			
Time O.K. (By Foreman)	Total Time For Day	HOURS	QUARTERS
One of these forms must be filled out for each separate job upon which a workman is employed on any day; Pay will otherwise be withheld. The forms are to be handed in every night to the TimeKeeper.			

FORM 17

DAILY TIME TICKET

Check No._____ Date_____ 190____

Name_____

Shop Order No.	Class of Work	Hours	Min.
O.K _____ Foreman	Total Time		

FORM 18.

(282) CORE-MAKER'S TIME CARD.

A core-maker's time card is shown in Form 19.

The cores are usually paid for at a certain rate each, making a fixed price for productive labor. The "discount" column represents imperfect cores, or what would be termed in other kinds of manufacturing, culls. In some cases it will be easily apprehended that culls represent an actual waste of material, so that where operators are careless, it is necessary to charge them with the value of this waste material.

COREMAKERS TIME CARD.

Name_____ No._____

Mark_____

Kind of Core	Made	Disct.	Good
Single Column			
20" Steam			
26" "			
32" "			
20" Water			
26" "			
32" "			
Two Column			
20" Steam			
26" "			
32" "			
38" "			
45" "			
20" Water			
26" "			
32" "			
38" "			
45" "			
Three Column			
20" Steam			
26" "			
32" "			
38" "			
45" "			
20" Water			
26" "			
32" "			
38" "			
45" "			
Special			
O.K.			

FORM 19.

(283) REPAIRS RECORD.

Where repairs form an important feature of the work done, the complete job is frequently placed in the hands of one man, and a good form of time record in this kind of business is illustrated. See Form 20.

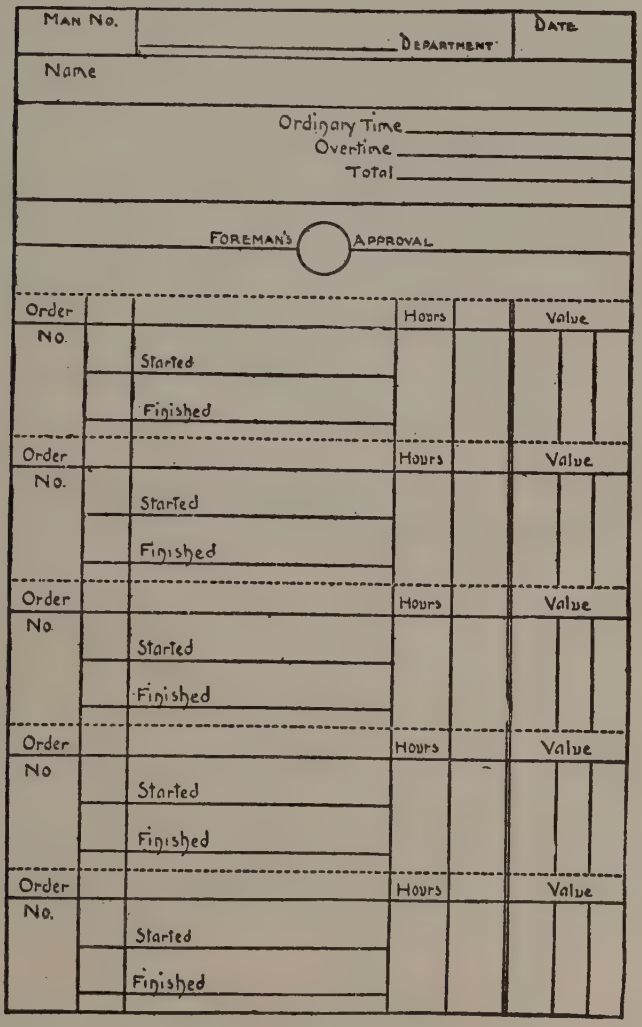
Name Jno Johnson Date August 1st 1904

Use top column for number of Job only.

| | | |

(285) COUPON RECORD.

A coupon form of time card, where numerous small jobs are attended to by one workman, is shown. This form of card enables the workman to turn in particulars on each job, to the office, as completed, without having to obtain a new card each time.

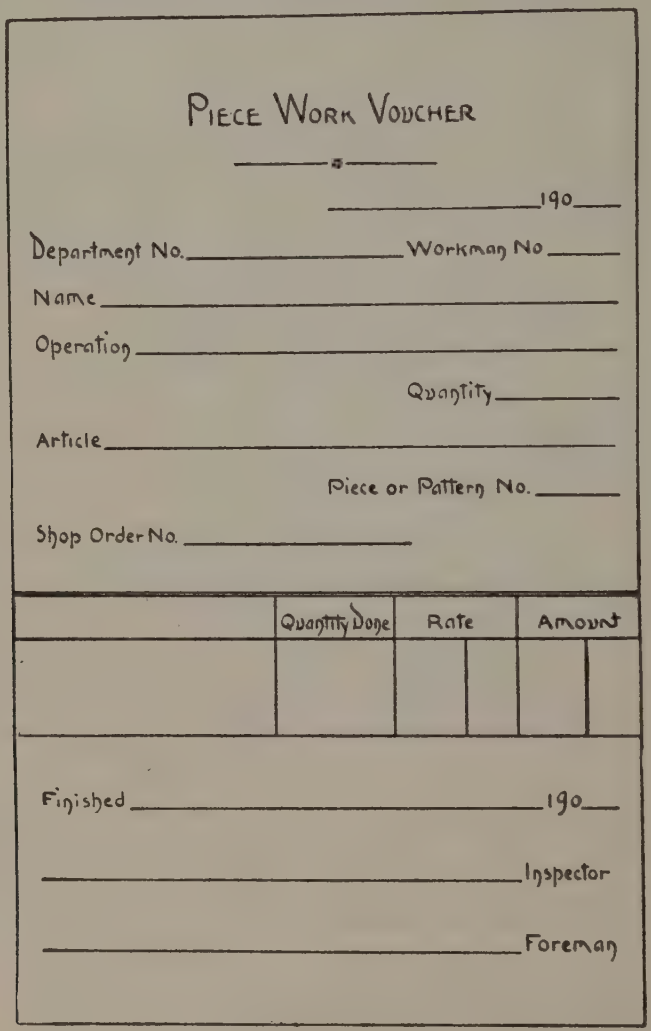


FORM 22.

COUPON TIME RECORD.

(286) PIECE-WORK RECORD.

A piece-work time card is illustrated in Form 23. It is termed a voucher, because, after having been O. K.'d by the inspector and the foreman, the operator uses it as a voucher to obtain the amount due him on the work.



PIECE WORK VOUCHER

_____, 190____

Department No. _____ Workman No. _____

Name _____

Operation _____

Quantity _____

Article _____

Piece or Pattern No. _____

Shop Order No. _____

	Quantity Done	Rate		Amount	

Finished _____, 190____

_____ Inspector

_____ Foreman

FORM 23.

(287) PAY-ROLLS.

Specially appertaining to this branch of the subject is the departmental distribution of the pay-roll, for the purpose of making the necessary debits to general ledger accounts at the end of the month, and also of providing a check on the time accounted for by both direct and indirect labor records.

(288) PAY-ROLL DISTRIBUTION.

Form 24 shows a summary of pay-roll distribution, this having been effected in the usual way, as illustrated in Form 25.

Pay-Roll Week Ending _____ 190____

Department	Amount		Total	
Varnish Mfg Name				
Can Mfg "				
Box Mfg "				
Laboration "				
Total Labor Account				
Labelling and Filling Name				
Storekeeper Department "				
Shipping "				
Teamsters "				
Watchman "				
Total Factory Expense Account				
Approved _____ Supt	Total			

FORM 24.

Another style of distribution is shown in Form 26. Here the men engaged in each department are listed together, and the departmental amounts extended in a special "Total" column. In this particular form, signatures are obtained as receipts for wages paid. There is no objection to this plan where uniform scale of wages prevail, but otherwise, it is not considered advantageous to permit one workman to know what another is earning.

Pay-Roll and

No	Name	Kind of Work	Quantity	Piece Work Rate	Hour Rate	Amount	Deductions	Net Amount
1								
2								
3								
4								
5								
6								

Distribution

Varnish Department	Can Department	Box Department	Laboratory	Labeling and Filling	Store-Keeper	Shipping Department	Teamsters	Watchmen

FORM 25.

Name	No	Rate
Thorsen John M.	3	35
Wilson Jos. B	4	35
Lewis Wm H	5	20
Larson Ole	6	15
Smith Charles	7	15

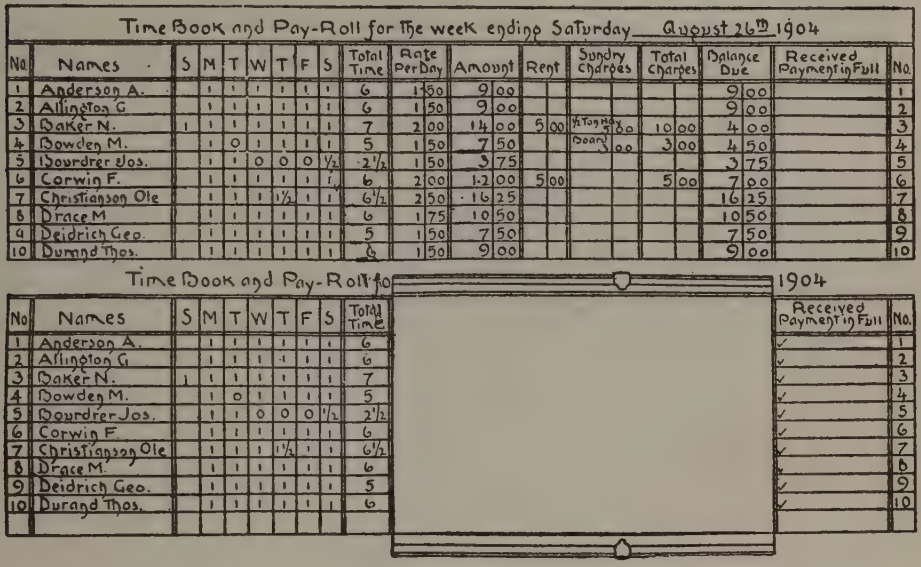
Pay-Roll From To

Sun.	Mon.	Tues.	Wed	Thur.	Fri	Sat.	Total Hours	Amount	Total	Signatures
	9	10	10	10	10	11	60	21 00		
	10	-	10	10	10	10	50	17 50		
	5	5	10	10	10	10	50	10 00	48 50	
10	10	10	10	5	10	5	60	9 00		
	10	10	5	5	5	10	45	6 75	15 75	

FORM 26.

(289) SIGNATURE DEVICE.

This difficulty may be overcome by a movable device, such as shown in Form 27.



Time Book and Pay-Roll for the week ending Saturday August 26th 1904

No	Names	S	M	T	W	T	F	S	Total Time	Rate Per Day	Amount	Rent	Sundry Charges	Total Charges	Balance Due	Received Payment in Full	No.
1	Anderson A.		1	1	1	1	1	1	6	1 50	9 00				9 00		1
2	Allington G		1	1	1	1	1	1	6	1 50	9 00				9 00		2
3	Baker N.	1	1	1	1	1	1	1	7	2 00	14 00	5 00	½ Ton Hay 5 00	10 00	4 00		3
4	Bowden M.		1	0	1	1	1	1	5	1 50	7 50		Board 3 00	3 00	4 50		4
5	Bourdrer Jos.		1	1	0	0	0	½	2½	1 50	3 75				3 75		5
6	Corwin F.		1	1	1	1	1	1	6	2 00	12 00	5 00		5 00	7 00		6
7	Christiansson Ole		1	1	1	1½	1	1	6½	2 50	16 25				16 25		7
8	Drace M		1	1	1	1	1	1	6	1 75	10 50				10 50		8
9	Deidrich Geo.		1	1	1	1	1	1	5	1 50	7 50				7 50		9
10	Durand Thos.		1	1	1	1	1	1	6	1 50	9 00				9 00		10

Time Book and Pay-Roll for [redacted] 1904

No	Names	S	M	T	W	T	F	S	Total Time	Received Payment in Full	No.
1	Anderson A.		1	1	1	1	1	1	6	✓	1
2	Allington G		1	1	1	1	1	1	6	✓	2
3	Baker N.	1	1	1	1	1	1	1	7	✓	3
4	Bowden M.		1	0	1	1	1	1	5	✓	4
5	Bourdrer Jos.		1	1	0	0	0	½	2½	✓	5
6	Corwin F.		1	1	1	1	1	1	6	✓	6
7	Christiansson Ole		1	1	1	1½	1	1	6½	✓	7
8	Drace M.		1	1	1	1	1	1	6	✓	8
9	Deidrich Geo.		1	1	1	1	1	1	5	✓	9
10	Durand Thos.		1	1	1	1	1	1	6	✓	10

FORM 27.

(290) HARDWARE MANUFACTURING BUSINESS PAY-ROLL.

Another example of pay-roll distribution is shown in Form 28, this being arranged for the requirements of a hardware manufacturing business.

HARDWARE MFG Co's Pay Roll for week ending March 18-1904

Names	M	T	W	T	F	S	Job Hours	Day Hours	Price	Amount Day Work	Amount Job Work	Total	Deductions	Net Amt Due

Summary of Pay-Rolls From ____ to ____

1904 Week Ending	Pattern Dept.		Iron Foundry		Brass Foundry		Pol. & Buffing		Machine Dept.		Assembling		Total		Per Cent	
	Day	Job	Day	Job	Day	Job	Day	Job	Day	Job	Day	Job	Day	Job	Day	Job

FORM 28.

(291) BRICK MANUFACTURING BUSINESS.

Pay-roll and distribution sheet used in the brick making business is shown in Form 29. This does not present any special features, although the general arrangement of the distribution is interesting and educational.

Wages Sheet and Distribution.

For _____ week ending _____ 19a

Name	M	T	W	T	F	S	Hours	Rate	Pay-Roll Amt Earned	Clay Stock Stored	Making Green Brick	Making Green Tile	Making Green Blocks	Wages Engine Room	Repairs to Engines	Repairs to Buildings	Dead Work	Cost Labor Burning: Brick	Tile	Block	Labor Selling Expense: Loading Cars	Loading Trans.	Sundries

FORM 29.

Pay-Roll For Half Month Ending July 16 0 1904

Department Foundry

Names	No	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Total Hours	Total Sect	Rate	Total Day Work	Total Piece Work	Total Labor	Deductions	Amt Due	Productive Labor	Non-Prod Labor
Wilcox	4	32	28		28	27	24	30	31	31		32	30	30	30	32	31			418	7		29 26	29 26	5 00	24 26	24 26	
Harbe	116	10	10		10	10	10	10	10	10		18	19	18	22	24	26		80	127	15		8 89	20 89		20 89	8 89	12 00
Lewis	78	30	30							29		30	31	32	31	28	30			272	7	12 00	21 76	21 76		21 76	21 76	
Delpray	149	30	32		31	30	31	28	30	31		31	31	31	32	30	18				8							
Nixon	11	10	10	10	10	10	10	10	10	10	10	10	10	10	10	8	10	10	8	166		15	24 90		24 90		24 90	24 90
Weaver	169	10	10																20		20	4 00		4 00		4 00		4 00

FORM 30.

Other useful and convenient forms of pay-roll in different lines of business, showing distribution to departments, piece-work, day-work, productive and non-productive labor, will be found in Forms 30, 31 and 32.

No. 30 is the form used for the foundry of a radiator manufacturing business. No. 31 is used in a mining camp, and No. 32 is interesting on account of the particulars of liquidation.

Pay-Roll Time For Month of October 1904

Name	No.	Camp No.	Time (Hrs.)	Rate (Pr. Hr.)	Amount Earned	DEDUCTIONS Hospit.	Board	Store	Balance Due	Signature of Employe
Macarom G.	1	2	147	14						
	1	3	27	14	24 36	1 00	11 46	4 37	7 53	

FORM 31.

No	Name	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Time Work A Total Time	A Rate Per Day	A Amt.	B Total Time	B Rate Per Day	B Amt.	C Total Time	C Rate Per Day	C Amt.	D Total Time	D Rate Per Day	D Amt.
1																																											
2																																											
3																																											
4																																											

Pay-Roll for Month of 190

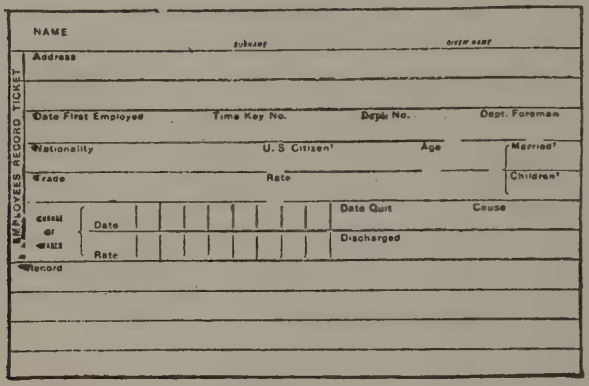
Piece Work A Total Pieces	A Rate Per Box	A Amt.	B Total Pieces	B Rate Per Box	B Amt.	C Total Pieces	C Rate Per Box	C Amt.	D Total Pieces	D Rate Per Box	D Amt.	Deductions	Total	Balance	Liquidation $20	$10	$5	$2	$1	50c	25c	10c	5c	1c	Paid	No	Remarks
																										1	
																										2	
																										3	
																										4	

FORM 32.

(292) DEPARTMENT PAY-ROLL FOR LARGE MANUFACTURING BUSINESS.

The following method of recording time and wages is in successful operation in a factory employing several hundred men.

The name and personal particulars of the new employe being ascertained, the facts are recorded on Form 1, the employes' record card, and, incidentally,



FORM 1.

the index reference to the pay-roll. A number is assigned to the employe, which is his pay-roll number. Form 2 is really a cross index for Form 1, and is a record of names having the pay-roll number noted at the top, and also shows the changes in rates, it being the authority for rates used on the pay-roll.

Proceeding to the pay-roll itself or what is, practically, a combined time

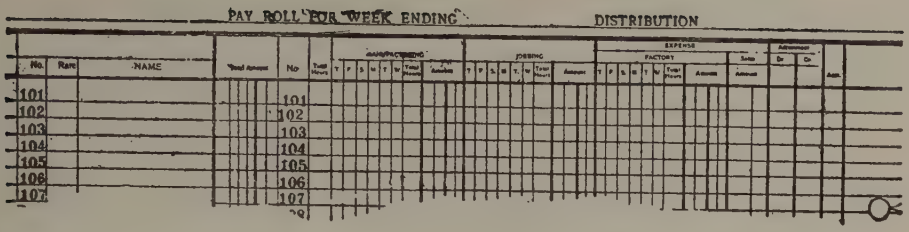
No.

Week Ending	Name	Rate	Remarks

FORM 2.

and pay-roll sheet, Form 3a shows the arrangement of the pay-roll sheets, in regard to the segregation of numbers, and explains fully the idea intended to be expressed here regarding the elimination of the useless writing of names each week.

The first step would be to segregate the numbers of employes in each



Emp. no	Name	M	T	W	T	F	S	TOTAL TIME DAYS	Rate	Extension	Deductions Advances	Amount Paid	Emp. No.
100	J Jones			X				5	2	10	1.00	9 00	100
101	C. Hayes					X		5	2 50	12 50		12 50	101
102	L. Lange							6	2	12		12	102
103	C Jackson							6	2 50	15		15	
104	R. Myer							6	3	18			
105	L. Mangler							6	2 50				
106	C. James							6	2				

FORM 3.

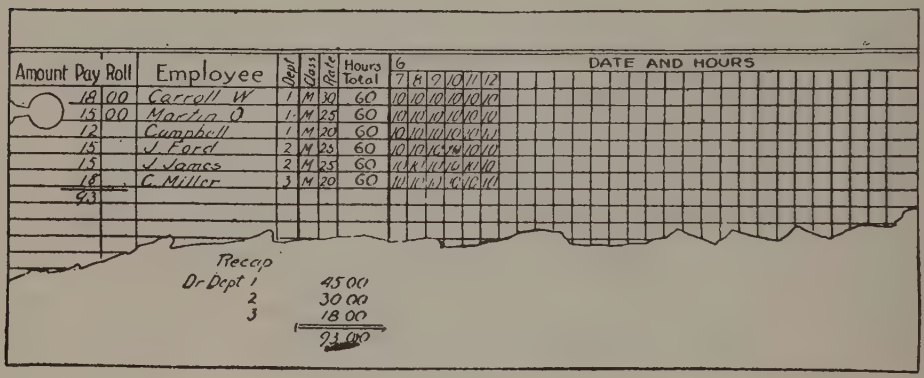
department in such a way as to secure numerical progression, or, in other words, allot a block of numbers to a department, for instance, Department 1 will get Nos. 100 to 199; Department 2, 200 to 299, and so on. Under this arrangement, it will be noted that the department is recognized by the "hundreds" number. This arrangement may or may not serve the purpose, owing to the size of departments, but irrespective of the difference in size of departments, if sufficient numbers are allotted, the same result will be obtained. An arrangement of this kind will bring in numerical order the employes of each department, and by careful arrangement of numbers to the pay-roll page, independent footings of each department may be obtained.

In cases where the workman's day is "split up" among the various departments, their time can be recorded hourly on a sheet similar to that of Form 4. Reference to this form will show an arrangement for recording the time of these departments, as well as designating the department for which the work is performed. At the end of the week this sheet can be figured and through an analysis and recapitulation of the entries, the time to be charged to the departments may be easily arrived at. On the pay-roll proper these departments will be arranged like the others, so that the total

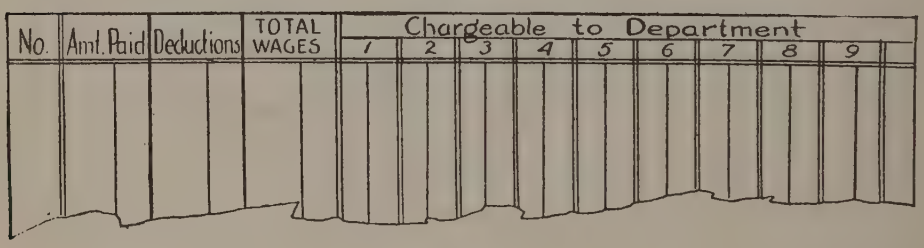
of time charged on their time sheets will agree with their sections on the pay-roll.

The pay-roll for a large concern must occasion the writing of a great many names, but this plan shows to a certain extent how the re-writing may be eliminated. The bottom sheet is simply a memorandum, as it were, of the name of the employe, rate, number, etc.; these are written perhaps once in six months, and owing to the constant coming and going of employes, may be written with pencil.

On this sheet, and aligned with it, is placed the permanent pay-roll. No names appear here, but only the numbers of the employes, as well as time, wages, etc., do. There will be seen here the importance of the record and pay-roll cards, Forms 1 and 2, in connection with the pay-roll, and one book



FORM 4.



FORM 5.

may be arranged to show several month's pay-rolls with but one writing of the names. The permanent pay-roll is filed in a binder for the purpose and the memorandum is ready for the next week's business.

If the complete segregation cannot be accomplished, one time sheet (Form 4) could be made out for each department, using the memorandum and permanent sheet method as explained, and then having the pay-roll sheet itself ruled as per Form 5, again using the method illustrated to save the re-writing of the names.

(293) SILK RIBBON MANUFACTURING BUSINESS.

In the silk ribbon manufacturing business, the distribution of the pay-roll contains the following headings:

Dye-house—
- Color Shop,
- Skein Silk Finishers,
- Dynamite Shop,
- Black Shop.

Blocking Room—
- Beaming and Reeling,
- Labelers,
- Boxers,
- Pickers,
- Blockers,
- Ribbon Finishers.

Shipping Room.
- Foreman,
- Helpers.

Throwing Dept.—
- Hard Silk Winders,
- Quill Fillers,
- Warpers,
- Weavers,
- Twisters,
- Loom Fixers,
- Board Carriers,
- Machine Shop Labor,
- Carpenters' Shop Labor,
- Stable Men,
- Engineers,
- Electrician,
- General Help.

The weaving is done on the piece-work plan, according to the number of cuts—the rates paid varying with the quality and width of the ribbon. The cuts are usually eighteen yards for each space on the loom, the number of these spaces depending upon the number and sizes of widths wanted. The material used consists of raw silk and cotton. A considerable time is employed in preparing the loom to receive the cuts, there being as many as twenty-eight pieces on the loom to be provided with cuts.

Each weaver is supplied with a coupon arranged with perforated spaces for a record of the cuts. As each weaver completes his cut, one of these detachable coupons is torn off by the foreman, who marks the weaver's name and loom number on same, and turns it into the office. From these coupons, the amount earned by the weavers on piece-work is computed.

(294) PIECE-WORK AND PREMIUM SYSTEMS.

In connection with the record of work done in manufacturing establishments, the question of the advisability of the use of piece-work and premium systems very frequently arises, as also the best way of keeping record of the employes themselves.

As a basis for an equitable premium system, nothing better could be suggested than that submitted some little time since, which was approved by a number of manufacturers, and published in a technical magazine.

1. That each employe shall be guaranteed his regular day's work wages.
2. That the time limits shall never be lower than the average time made with the same tools under the day's work plan.
3. That no one shall be discharged because of failure to reduce his time below the limits.
4. That in addition to his regular wages, each employe shall be paid one-half of his hourly rate for each and every hour he may reduce his time below the prescribed limits.
5. That the limit once fixed shall not be lowered except through the introduction of new methods of doing the work.
6. That all premiums shall be paid within two weeks of completion of the work upon which they are earned.
7. That at the end of one year's time, the plan will be withdrawn from all those not wishing to continue under it.
8. That, if withdrawn, the employe shall be required to work at the same rate of speed without an equivalent in wages.

The premium system can be adopted advantageously wherever it is possible to establish standard costs or standard quantities of production for each workman. This is, of course, only possible where certain standard articles are manufactured, as on special orders it is necessary to establish special costs.

It is customary to make contracts with operators on premium and piece-work orders, on a basis of six months or some other indicated period, after which an adjustment may be considered necessary.

Where it is desired to obtain the maximum production from the employe at the minimum cost, there seems to be no doubt that the prenium and piece-work plan offers definite advantages. An illustration of this is presented in the case of the leader of a strike that was inaugurated against the premium system. This man was a tool-maker, and afterwards returned to his old position, where he was paid 30 cents an hour. After making several requests to be transferred to a department in which the premium system was in operation, his request was ultimately granted, and he is now turning out three times as much work as formerly, on the day-rate basis, and earning 50 cents an hour instead of 30 cents.

It is stated that in some cases the premium system has increased production on machine jobs over 500 per cent., but this statement is probably in connection with exceptional conditions.

The figures given in the following tables are from actual practice, and quoted from the Iron Trade Review, in relation to the comparative saving of the premium plan over ordinary day work.

TABLE A.

Class of Work.	No. of Pieces.	Day Work. Hours on Job.	Day Work. Cost.	Premium. Hours on Job.	Premium. Cost.
Planer	200	200¾	$ 50.43	100	$ 39.75
Bench	300	375	75.00	231	60.60
Lathe	2,400	3,600	936.00	1,213½	625.14
Boring Mill	2,500	3,125	812.50	788	507.21
Lathe	250	2,000	530.00	427¼	264.42
Horizontal Mill	1,200	2,400	624.00	777¾	335.11
Bench	50	375	97.50	132	65.78
Bench	813	3,465¼	416.13	1,123	271.25
Total	....	15,541	$3,541.56	4,792½	$2,169.26

TABLE B.

Class of Work.	No. of Pieces.	Day Work. Hours on Job.	Day Work. Cost.	Premium. Hours on Job.	Premium. Cost.
Lathe	18	75	$ 27.75	33	$ 15.00
Planer	20	98	36.50	41	17.38
Boring Mill	20	74	28.73	28	12.75
Bench	50	176	52.80	102	41.70
Lathe	35	297	54.40	128	42.50
Planer	10	50	15.00	20	10.50
Bench	35	180	63.00	75	42.62
Lathe	85	102	25.50	48	18.75
Total	...	1,052	$303.68	475	$201.20

(295) PROFIT SHARING.

With regard to profit sharing, this plan of interesting employes does not seem to be a pronounced success, chiefly, we believe, for the reason that the employes are suspicious that the charges against profits have been stuffed to their prejudice.

Also, a possible yearly dividend of unknown dimensions does not appeal to the average wage earner, who much prefers a tangible increase in his weekly wages.

EXERCISES.

1. Exemplify general method for keeping account of material and labor occupied in ordinary manufacture.

Submit sketch of general shop order providing for records of different kinds of material used in process of manufacture.

2. Submit sketch of suitable shop order for a business which purchases one kind of raw material and manufactures therefrom by machinery seven grades of product, four distinct operations in different work shops being necessary to produce the completed article. Explain its use.

3. Where an article is produced in several departments or work shops and the work consists in the manufacture of several parts which are made at the same time and afterwards assembled, what would be the nature of the shop orders?

4. What are standard units? Explain their advantages in businesses manufacturing staple articles.

5. Explain best method of checking accuracy of time records on jobs, ascertaining waste time, and verifying the factory pay-roll.

6. Give illustration of shop order, time and material records, as used in some particular line of business, explaining any special features of same, and why these features are desirable and necessary in that business. Explain in detail the operation of the system, so far as it relates to time and material records, and suggest such changes as would, in your judgment, tend to improve it.

LESSON X.

COST ACCOUNTING AND SYSTEMATIZING.

DISTRIBUTION OF EXPENSE; COST SUMMARIES; COMPARATIVE STATISTICS; SPECIAL SYSTEMS.

LESSON X.

Cost Accounting and Systematizing.

(296) DISTRIBUTION OF EXPENSE.

The most efficient and convenient way of distributing General Expense is a problem that has demanded the most careful study and best efforts of the student of cost economics and factory administration. To discuss all of the various methods suggested for apportioning General Expense would be to present the views of all prominent cost accountants who have given the subject attention. Nearly every writer on the subject has some special plan which he proceeds to demonstrate as the best and only proper method. The apportionment of General Expense is therefore subject to no inflexible rule. The method followed in one factory might not be at all adapted to the requirements of a factory in a different line of business; in fact, it might not be suited for another factory in the same line owing to either differences in physical conditions or in the policy of the management. There are "man-hour" plans, "machine-hour" plans and "productive labor" plans, all of which have some merit, and in establishments where every operation is performed by machinery, such as glove factories, the "machine-hour" plan—properly adjusted—is probably the best. The principal objection made to any plan of distributing General Expense on the basis of the hour's work, instead of the value of the time occupied, is that the factors, time and labor, have no fixed relation with each other or with the quantity of production; so that a lot of cheap labor, producing nothing appreciable, would be taxed with a large amount of expense —while skilled labor, employed at great cost and being highly productive, would be loaded with comparatively nothing.

(297) TOTAL COST.

There appears to be considerable misapprehension in regard to the term "Total Cost." A great many students include general office, administrative and selling expense in total cost, but we believe this to be entirely incorrect.

Prime cost means direct cost, or the amount expended in material and supplies used and labor performed. Total cost means prime cost plus a certain fixed proportion to cover unproductive labor, depreciation, and general factory expense.

The statement that the total outlay in the production of a commodity is prime cost plus cost of selling, distribution, and administration is, in our opinion, an obvious fallacy, for how can the expense of distribution possibly form part of the cost of production? Furthermore, the inclusion of all this class of expense in one general percentage obscures or conceals valuable information. The manager of a business should be able to compare the percentages of factory expense, general expense, or administrative expense and selling

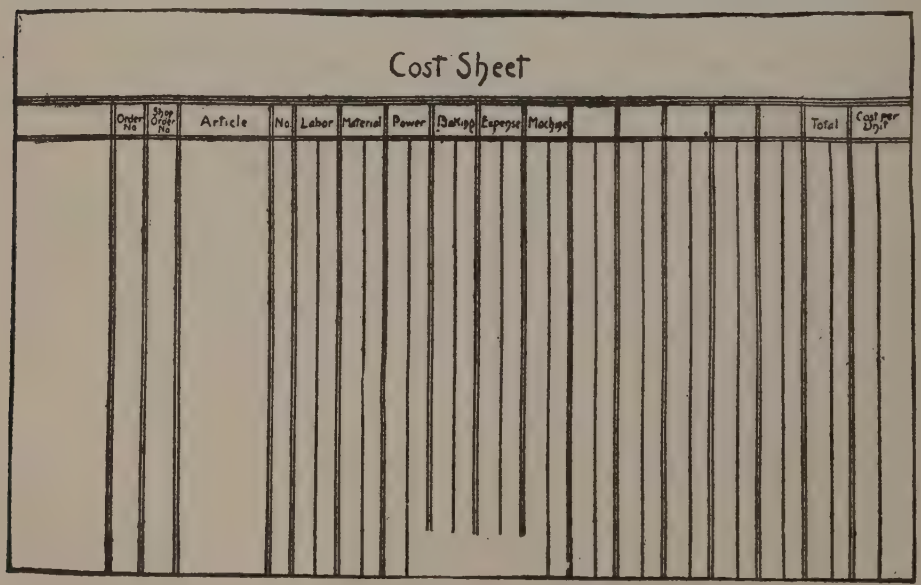
expense separately, on a basis of output for the first element, and on a basis of turnover for the last two elements. Selling expense does not in any way depend on the amount of production, but is exclusively and vitally connected with the amount of sales.

(298) COST SUMMARIES.

After having assembled the cost of material and the cost of productive labor on the shop order, the next step is the preparation of cost summaries, and comparative and statistical statements. The nature of these summaries and statements depends entirely upon the requirements of the business for which they are designed.

The ordinary cost summary is prepared for the purpose of providing the totals, which must be credited at the close of each month to material, labor and factory expense accounts, and debited to Manufactured Goods account or such sub-divisions of that account as may be found desirable.

It is also desirable that on these summaries should be provided the record of uncompleted orders, so that they may participate in the distribution or diffusion of factory expense. As we have the desired figures in regard to material and labor, it is now necessary to ascertain what amount of indirect labor and expense can be charged against the various completed and uncompleted orders. Forms 1, 2, 3 and 4 illustrate the manner in which cost records of this nature may be made up, and further illustrations will be given later in connection with the subject of Comparative Statistics.



FORM 1.

Monthly Report. Month of April 1904

MACHINE SHOP

Account B 207

Job No	Description	Total Hours	Labor	Non-Pro Labor	Machine	Shop Expense	Total
2895	2 Coupling Boxes with bands	35	9 20	92	2 00	1 01	13 13

FORM 2.

Daily Cost Report

Department C.I. February 29-1904

Number	Name	Factory Cost	Fixed Charges	Total Cost	Selling Price	Profit	Loss	Salesman's Name
20942	The Phila Inquirer Co	4 04	Percentage of Running Cost	Factory Cost plus Fixed Charges	7 75	Difference between Selling Price and Total Cost		

FORM 3.

COST RECORD

Order Name 1000 Finished Castings (Pattern 2495) Order No 750
For Date Issued
Date Closed
Ledger Acct

	Department	Hours	Labor		Operation and Maintenance Department		Operation and Maintenance General		Material		Total	
	A	262[2]	93	92	9	39	23	48			126	79
	B	582[2]	121	31	24	26	30	33			175	90
	C	52	13	13	4	38	3	28			20	79
	D											
	E	110	28	20	3	53	7	05			38	78
	F											
	Material								250	80	250	80
	Cost Each 613											
	Examined and Approved											
	Auditor											
	Manager											
		1007-	256	56	41	56	64	14	250	80	613	06

FORM 4.

(299) GENERAL EXPENSE.

Before proceeding further to discuss the general question of the apportionment of Factory General Expense, it will be well to define this important item. By "General Expense" we mean those items of cost which, while they cannot be charged to specific jobs, nevertheless add to the cost of articles manufactured. In General Expense are included such items as factory insurance, rates, general factory supplies, fuel and light, the salary or wages of superintendent, factory clerks, engineers, firemen and general laborers who cannot be otherwise classified. It is sometimes the custom to separate general expense and general indirect labor, placing in the latter division the labor costs above specified. Whether or not this division is made is immaterial, as it finally resolves itself into a general expense. For convenience, therefore, we shall use the broad term "General Expense" to cover all of these items.

(300) ELEMENTS OF FACTORY EXPENSE.

The term "Factory Expense" includes so many different elements that in factories of any magnitude it is absolutely necessary to sectionalize them.

The principal elements of factory expense will be readily recognized by the student of cost accounting as follows:

Unproductive Labor.
Machine Expense.
Light, Heat and Power.
General Maintenance Expense.
General Department Expense.
General Factory Expense of Superintendence.

(301) BASIS OF APPORTIONMENT.

In considering the cost of material or labor, it is an easy matter to determine the exact cost of the manufacture of a given article or of the article for a given period. The amount of material used and the cost of labor for a particular day is easily determined, but to ascertain accurately the cost of items entering into general expense, for a similar period, is usually impossible on account of varying conditions. Sometimes these variations arise from different seasons of the year, sometimes from changes in the weather, and sometimes from physical circumstances. Since, therefore, the items of general factory expense vary, and as these variations are not paralleled by similar variations in amount of product, the most equitable method is to distribute it over a period of twelve months. For instance, taxes are paid once, or at most twice, during the year; insurance premiums are likewise paid once a year. Now, if we were to add the entire cost of taxes and insurance to the cost of the goods manufacturing during the month in which they are paid, we would be imposing an unfair burden on those goods, while goods manufactured during the balance of the year would carry no part of this burden.

The question of the measurement of machine rates is not the only difficult cost accounting problem, and although the general subject of the distribution of overhead or general factory expense has been given profound attention, it is discouraging to find that a number of accountants who supposed themselves to be authorities should assert that this element of cost should be pro-rated on the basis of the value of goods actually produced.

(302) DISTRIBUTION OF RENT.

Let us take up the question of rent as an example. On the first floor of a large factory some artistic goods are produced that require a great deal of skilled hand work. On the second floor of the same factory some common goods of the same kind are made, but for a cheap market. The value of the articles produced in a month of the artistic goods amounts to—material, $1,500; labor, $5,000; prime cost, $6,500. The value of the cheap articles produced in the same time amounts to—material, $1,200; labor, $2,000; prime cost, $3,200.

The proportion of rent of these two floors, according to floor space used, is $200, or $100 for each floor. By pro-rating on the basis of total production, the first floor is charged with $134, and the second floor with $66.

At another factory the conditions are reversed. On the first floor the cost of goods produced in one month amounts to—material, $5,000; labor, $1,500; while on the second floor the cost of goods produced amounts to—material, $2,000; labor, $1,200.

In the first case, therefore, the first floor is charged a high rent because of the value of the labor, and in the second case it is charged a disproportionate rate because of the value of the material. This comparison leads us

to inquire what relation the rent of any particular floor of a factory bears to the value of the material which may be stored therein.

We can see that if the rent is to be paid out of the revenue derived from the results of the labor of the operators, it might fairly be distributed according to the cost of the work done in the building. Let those who produce the value be charged with the expense of producing it in proportion to the general cost of running the department in which the product is made.

Suppose, for instance, that each operator were an independent producer, making some special article or commodity for sale, and renting a certain amount of space for himself and his machine to do the work. The proprietor of the factory would charge the operator a certain amount of rent either for the space he occupies or for the length of time he uses the space.

Did any one ever hear, as a serious proposition, of a landlord endeavoring to ascertain the value of the raw material used by the operator in producing his commodity and charging a certain amount of rent based on that value? The whole idea appears to be entirely impractical, unscientific, and preposterous.

We believe the best plan is to distribute rent on the basis of floor space used. Where this can not be done, it should be pro-rated on the basis of productive labor. The latter plan is satisfactory because it makes each man's work contribute toward the rent of the premises he occupies for the purpose of doing that work, and the same principle may be applied to the treatment of machinery.

A machine can be figured on as an operator having a certain fixed time to live (subject, of course, to contingencies). Its time is taken just as in the case of any other operator, and a certain amount charged to the job for that time, and the proportion of rent may be included in this charge, either on the basis of floor space occupied, or cost of the work done by the machine, the latter being included in the general total of productive labor.

But no sane person would suggest that if the machine is stamping buttons the rent charge should be adjusted on a basis of the metal used in making the buttons.

Another point of constant discussion is the disposition of time lost between jobs. This is simply the difference between the time-keeper's records and the time actually accounted for on the cost records. It should, therefore, be included with other non-productive labor in the general factory expense. The cost of labor should not materially vary, but factory expense may, and probably will, materially vary unless closely watched.

(303) DEPARTMENT STORES DISTRIBUTION.

Referring to the proper distribution of expense in department stores which usually contain both retail and manufacturing departments, a number of fine points are involved. While in other businesses one basis only is used, as a rule, in this class of business there are different methods adopted and in

some cases two different methods in the same store. In some New York department stores, as also in stores located in other cities, distribution is worked out as follows:

SPACE BASIS.

First the value of space on a rental basis is determined for each floor of the building, *i. e.*, space on one floor may be considered worth $2 per square foot, on another floor $1.50, another $1,25, and so on down. Each department is then charged a rental for the space occupied, on the basis of these figures. Next the total rental value of the building is determined, and for each department there is obtained its per cent. of the whole.

All general expenses, not chargeable to given departments, such as heat, light, power, delivery charges, stable expense, etc., are totaled and the amount is distributed to the several departments on the basis of the per cent. of rental value charged to the department. In other words, the general operating expenses are distributed on the basis of floor space occupied, a department which occupies floor space valued at five per cent. of the whole paying five per cent. of these expenses.

The idea of distributing expense on the basis of floor space is quite common, but the question is asked, Is such distribution equitable as between the different departments? A department store auditor, on being questioned on this point, replied:

"We will take the Notion Department as an illustration. This department shows but little profit, as both the amount of sales and the margin of profit are small, but it occupies space on the street floor where space is valuable. It occupies but little space, however, so that the per cent. of expense charged to this department is equalized."

There does not seem to be much room for criticism of that explanation. When carefully analyzed it is found that other methods of distribution are no more equitable. But now comes the method of distributing strictly overhead expense, such as taxes, insurance, repairs to buildings, etc.—a method which to many accountants will appear revolutionary.

BASED ON INVENTORY.

Accounting is regarded as an exact science. Recognized standard practice in accountancy does not tolerate fictitious values and frowns on the practice of inventorying goods at values higher than cost prices thus showing fictitious profits. But what would our friends in England, where tradition plays so important a part, say if it were proposed to distribute expense on the basis of the goods on the shelves instead of basing such distribution in some manner on the business actually transacted.

This is exactly what is done in the distribution of overhead expense in some of the leading department stores in this country. A department is charged with such percentage of the total overhead expense as its inventory bears to the total inventory.

"Revolutionary, indeed!" you say. But here is the reason given by the auditor of a prominent store. Every department manager is responsible for the success of his own department. He is both buyer and sales manager. He must buy judiciously and only of such goods as will readily sell at a profit. If he loads up with unsalable goods, he is tieing up the money invested and reducing profits. By charging him with overhead expense in proportion to his unsold goods he is kept on his guard. The only way he can reduce that charge is by keeping his investment in stock down to the minimum, without neglecting the actual requirements of his department.

This is not a new practice among department stores, as it has been used for some years, but regarded from the standpoint of accounting practice, it is unique. It brings up the question, To what extent can it be equitably applied to other commercial lines? If it is good for a department store, why not for a jobbing or wholesale house? If a buyer of notions in a wholesale house makes a bad "buy," why should he not be penalized?

(304) MACHINE RATES AND MACHINE HOURS.

The question as to whether cost should be measured by the hour or by the product has always been found a most difficult problem in cost accounting.

By some accountants it is believed that when specifications or estimates are made by the hour, the hour system of ascertaining cost is to be preferred.

As a general rule, however, the estimator is working in the dark, for no two men and no two machines can be counted upon to produce each hour of the day exactly the same amount in product.

There seems to be a growing preference for arranging wages on the piecework plan. This plan being often introduced into ordinary mercantile offices.

If it is found that the calculations on estimates by the hour compare favorably with the actual cost, there is plainly no reason why the machine hour system should not be used, but it is stated that the question of estimating correctly by the hour is understood by very few people, whereas estimating by the yard or by the mile is comparatively easy.

If, for example, 2,000 particular parts of a machine cost $10.00 in labor, it is clear that the cost per part is one-half cent each, but if it is not certain that it took the same amount of time to make each part, the cost cannot be correctly determined.

The old theory was that the total cost of raw material and labor gives the total cost of the product. This is all wrong, and leads to ruin sooner or later, wherever practiced. Labor consists of productive labor and non-productive labor. Suppose a workman, or workman and machine, consumes 100 hours on a given job, and the man receives thirty cents per hour; this makes the primary labor cost $30.00. The man probably consumed from two to ten hours in preparing the machine for the work to be done; then he had a helper around; a foreman was necessary; he had to use oil, waste, and a hundred other departmental things absolutely necessary to do the work at all. Hence the items "labor" should include all "dead help" or all non-productive labor, foremanship, strictly departmental expenses, etc. Suppose all this is found to

be forty cents per working hour per productive man, the primary cost is thus increased to seventy cents per hour.

(305) depreciation of machinery.

Crediting the Depreciation Reserve account serves the purpose of leaving the machinery account on the books intact, but in making up the balance sheet the asset accounts, machinery, tools and fixtures are offset by this reserve for depreciation, thus showing the net value of the investment. Some manufacturers deduct the annual depreciation from the original account each year, the machinery account on the books showing a value which may or may not be correct in proportion to the correctness of the amount depreciated. In case of fire, this method would play directly into the hands of the fire insurance company in adjusting the losses, as the machines might be worth far more than the actual book values stated.

(306) percentage plan.

In spreading the cost of General Expense over the entire year, we are confronted with the question of how best to apportion this cost to individual jobs. We cannot base the percentage on selling price, as we have nothing to do with the selling price, when figuring manufacturing cost. We must, therefore, base it on either one or both of the otherwise known items of cost, viz.: material and labor. Our logical choice is that item subject to the least fluctuation. Occasionally there will be found lines of manufacture in which there is less fluctuation in the cost of material than in the cost of labor, but as a rule, the cost of labor is the more stable of the two. Carrying this idea to its logical conclusion, we see that by basing the General Expense on the pay-roll, we have a fair distribution of expense.

We will take the total pay-roll for the year, first deducting those items of labor which we have included under the head of "General Expense," and we will divide the total amount of General Expense for the year by the total pay-roll for the year. The resulting percentage is our basis for charging general expense on each job. For the sake of illustration, suppose the amount of General Expense last year equalled 30 per cent. of the pay-roll, not including labor items entering into General Expense. On each job, then, we will add for General Expense an amount equal to 30 per cent. of the known labor cost of that job.

The plan above outlined will be found entirely satisfactory in large numbers of manufacturing establishments, but where a perpetual balance is required, we refer the student of cost accounting methods to paragraph 318.

(307) SECTIONALIZATION OF PAY-ROLL.

In the above paragraphs we have given another illustration of the importance of sectionalizing the pay-roll. If we have those items of labor which we class as "General Expense" in a division by themselves, it is an easy matter to deduct their total from the total pay-roll.

While the above general plan of appropriating General Expense will be found satisfactory in most concerns, there are those who contend that the apportionment should be based on the combined cost of material and labor. We consider this an unimportant distinction as in either case the total of General Expense for the year is supposed to be accounted for in the cost of manufacture.

Since we cannot look ahead and see what the exact cost of these items is to be during the current year, the most practical alternative is to use the figures for the previous year as a basis. At the end of each quarterly, or semi-annual period, the differences that will creep in can be adjusted, but in the main, the general percentage of expense will be about the same year after year, provided the general conditions remain the same and that the output has neither materially increased or decreased.

In many businesses, however, the method above recommended for distributing the factory expense on the percentage basis as obtained from the previous year's statistics would not be altogether satisfactory because of the many variations in production, cost of labor and consequently in the proportion of expense to the productive pay-roll. With a view to presenting the subject, therefore, in such a manner that the reader may thoroughly understand it, we quote from an able article by a prominent authority on this matter:—

"The first stage in compiling the cost record—the handling of direct labor and material to show prime cost—is quite generally understood, and the closing of the same into product accounts is familiar to all cost accountants and is now, I think, the regular practice, and so far there are but few opportunities for discussion. But when the next stage is reached and we are confronted with the question of manufacturing expense, its calculation and distribution, we begin to find differences of opinion. The 'man-hour' method has its advocates and the 'machine-hour' method has its disciples, and the selection of method is not an easy one to decide. To my mind, both of these plans are objectionable, the 'man-hour' method because

(308) MAN-HOUR RATE.

(*a*) The 'man-hour' rate cannot be calculated until the end of the period and the cost record of job work finished in the meantime cannot be made up until this rate has been determined. This not only embarrasses the cost department, but delays the prompt rendering of bills.

(*b*) The cost of job work done by departments, operated at a high rate of expense is calculated at the average 'man-hour' rate, which may fall far below the correct department rate, and the record does not show true cost.

(*c*) Many manufacturing concerns simply record hours worked on job without totaling same (except in special instances) dealing only with the actual cost of labor. 'Man-hour' plan not only requires the cost of labor, but necessitates the calculation of hours worked additional, oftentimes a big imdertaking and an unnecessary duplication of work.

(309) MACHINE-HOUR RATE.

The 'machine-hour' plan may be rightly criticised:

(*a*) Rate of distribution cannot be calculated until the end of the period.

(*b*) A machine of great efficiency that saves the labor of three or four men, bears no larger proportion of expense than a smaller one of ordinary capacity.

(*c*) 'Machine-hour' plan not applicable to departments where no machinery is operated—carpenter and painting departments, etc.

(*d*) Bench or hand-labor bears no expense under this plan.

PERCENTAGE PLAN.

The question now arises, if not one of these two plans, what then? The intent of this article is to lay before our students the 'percentage' method of distribution as one that meets the objections to the two plans already cited, and is already known and used doubtless by many. The 'percentage' method is not new, and it is the desire of the writer simply to emphasize its merits, having successfully used it and found it very satisfactory. As one of its advocates, I claim for it the following:

1. Costs can be made up immediately on completion of work—no delay.
2. Each department working on job bears its own proportion of expense—an equitable adjustment.
3. Consideration of hours worked unnecessary—one operation only.
4. Ease of calculation—a labor saver.

For the benefit of any who may not be familiar with the 'percentage' method of distribution, it may not be out of place to take up the subject more at length.

As there is hardly a month in a large manufacturing plant that there is not some item of extraordinary expense taken up on the books, it is apparent that a more satisfactory rate of distribution is obtained by basing the calculation on an expense account extending over a few months, say four or six; this we may assume as a fair average of what the regular expense of a department will probably be.

As the subdivisions of general expense are usually kept in separate accounts, administration, office, telegraph and telephone, postage, printing and stationery, insurance, taxes, freight and express, traveling expense, etc., it is obvious that the combined total of these accounts represents the total general expense to be distributed. In order to show this amount and the amount actually distributed, it is well to close monthly all the several expense accounts and concentrate them all into one account, 'General Expense Distribution.' This done, the private ledger shows the individual expense account of each department as well as the general expense. The general percentage is naturally the result of the total productive labor into the total expense as shown below.

The productive work of the department must bear its own departmental expense as well as its proportion of the general expense, and if these amounts be tabulated and the cost of the productive labor also shown, it is a simple calculation to determine the amount of expense to be borne by a dollar's worth of production, thus:

	Operating Expense, 4 Months.	Productive Labor, 4 Months.	Calculated Rate for Distribution.
Dept. A	$ 843	$ 8,179	10.3%
Dept. B	490	2,508	19.5%
Dept. C	1,179	3,387	34.8%
Dept. D	6,217	12,520	49.7%
Dept. E	493	4,231	11.6%
Dept. F	1,288	25,376	5.3%
General	148,357	613,429	24.2%

These different percentages having been calculated as the result of operations for the last period, adopt them as the rate of distribution for the following period. The ledger expense balances will always show the results of distribution, and at the end of three or four months, revise the distribution rate if desirable. If it is found that the balance of undistributed expense is increasing, increase the percentage; if, on the other hand, the rate used is over distributing, reduce the percentage. It will be found in a very short time a schedule of percentages can be arranged that will very nearly evenly balance out all the expense accounts.

In a large manufacturing plant employing a great many men with a weekly pay-roll of $5,000, to be distributed over hundreds of job orders, the calculation of expense to be earned by each individual job can be further simplified by using an even percentage for rapid calculation instead of the odd percentage as actually figured, with equally satisfactory results. This will prove a great labor saver, for the expense can be figured mentally and very rapidly. To overcome this objection to using odd percentages, I would substitute the following distribution rates for those already shown:

	Instead of	Use
Dept. A	10.3%	10%
Dept. B	19.5%	20%
Dept. C	34.8%	33⅓%
Dept. D	49.7%	50%
Dept. E	11.6%	12½%
Dept. F	5.3%	5%
General	24.2%	25%

Now when a job order has been finished, make up the cost at once. There is nothing to prevent this, for all the data is immediately available. To the cost of labor by each department there must be added two items of expense, one to cover the job's proportion of the department expense and one as its share of the general expense, and when the cost record has been made up its recapitulation sheet will show substantially as follows:

COST RECORD.

Order Name 1000 Finished Castings (Pattern 2495) Order No. 750
For Date Issued
Date Closed
Ledger Acct.

Department	Hours	Labor	Operation and Maintenance: Department	Operation and Maintenance: General	Material	Total
A	262½	93 92	9 39	23 48		126 79
B	582½	121 31	24 26	30 33		175 90
C	52	13 13	4 38	3 28		20 79
D						
E	110	28 20	3 53	7 05		38 78
F						
Material					250 80	250 80
Cost Each = .613						
Examined and Approved						
Auditor						
Manager						
	1007	256 56	41 56	64 14	250 80	613 06

FORM 5.

At the end of the month, when the cost summary is drawn off to ascertain the product of the plant for the month, it is apparent that the total of expense charged to job work by Department A should be credited to 'Operating Expense Dept. A,' Department B expense to 'Operating Expense Dept. B,' etc., and the total of general expense charged to productive work should be credited to 'General Expense Distribution.' The private ledger then shows:

1. Total operating expense, by departments and general.
2. Amount distributed on account of same.
3. Balance representing either under or over distribution.

That there will always be these balances is evident, for no plan of distribution can be devised to distribute in anticipation exactly an expense account whose total is unknown and which cannot be determined until the end of the month or period.

Although these balances are purely loss and gain items, instead of closing them out, it is preferable to carry them over into the next period, for future distribution."

(310) TOOL-RATE PLAN.

There are, however, some lines of business where it is found that the machine-hour, or tool-rate plan of diffusion, gives the best results. In one shop recently mentioned, there are men earning from 30 to 35 cents per hour running machines that cost $5,000, and men earning approximately the same rate of wages, running machines that cost from $500 to $1,000. By the ordinary percentage plan, the charge for the use of these tools would be approximately the same in either case, because the rate of wages paid is the same. By the tool-rate plan, each machine would have a distinct rating, based on "interest earned on original cost, cost of power to run machine and space occupied in the shop, with a fourth item added to cover general expense."

(311) ESTABLISHMENT EXPENSE.

The depreciation of the expensive machinery will be proportionately heavier than that of the cheaper machinery, just as the cost of skilled operators is higher than that of inferior operators. Each order, therefore, per-

formed by the aid of expensive machines, will bear a proper proportion of their cost. Dicksee, in his "Advanced Accounting," recommends that "Establishment Expenses should be sub-divided into two or more headings, and a separate amount for Established Expenses debited in respect of each group, upon the principle that appears to be the fairest. For the sake of more clearly showing what is intended here, the following sub-division is given. It must be understood, however, that each case should be carefully considered upon its own merits, in order that an accurate basis of apportionment may be arrived at.

(1) Establishment Expenses to be provided for by way of a percentage on the number of hours booked to the job—

Rent of Factory.
Rates, Taxes, and Insurance of Factory.
Salaries of Factory Managers.

(2) Establishment Expenses to be provided for by way of a percentage on the amount of wages paid—

Depreciation of Machinery.
Motive Power.

(3) Establishment Expenses to be provided for by way of a percentage on total prime cost—

General Office Expenses.
Discounts and Bad Debts."

(312) COMPARATIVE STATISTICS.

Cost summaries were originally intended to furnish totals to be used for debiting and crediting the various statistical accounts carried on the general books of a manufacturing concern. They have, however, been elaborated and extended, so as to cover almost every requirement in the way of statistics and comparative factory information. The variations of form being wholly dependent upon the kind of business and the nature of the information found useful in carrying it on to the best advantage.

It will not be necessary at this time to call attention to every variation and its purpose. The sectionalization of expense and the establishment of units wherever possible, are conspicuous elements in the construction of these statements.

Comparative statistics are not essential constituents of a cost summary and such statistics may be assembled independently of the recapitulation of the elements of cost, but it appears to be generally understood that a combination of the form of cost summary with a comparative recapitulation, as above indicated, furnishes a clear and more easily comprehensive bird's-eye view of the transactions of a business, than can be obtained in any other way.

Form 6 is a summary of labor cost for comparative purposes. Form 7 shows statistics of the weaving department, and Form 8 of the cloth room of a cotton mill. In order to accomplish their purpose, these two reports must be carried to another summary, which we show under Form 9. The particu-

lars here illustrated must again, in order to achieve the best results, be arranged in comparative style, either by months or other convenient periods.

Summaries of a lumber manufacturing business are very comprehensively shown in Forms 10 and 11 and can be studied with considerable profit as the departmentalization is particularly good and the final result illuminating. Forms 12 to 19 illustrate the cost records of another lumber manufacturing business arranged in a somewhat different style, but equally interesting and comprehensive.

Labor Record

Item

Unit_____

Date	Clock No.	Cost of Labor per Unit																	

FORM 6.

The Cotton Mfg Co. Mill No 3 At Brookside
Weaving Dept Report for_____ending_____19___

Stock on Hand		Operation			Cloth Woven			Production			
Boxes of Fill	Extra Warps	Looms Run	Looms Stopped	Cause of Stopping	Style	Picks	Yds per lbs.	Cuts	Yards	Yds per Loom	% of Full Production

Special Matters	Waste	Supplies Received
Total Hands	Warp " lbs	
Hours Run	Cop " "	
Production	" " per Loom oz	
Pay Roll		
Cost per lb		
Speed of Looms	Sweepings	
Seconds Inspected		
New Weavers		
Weavers Learning		

FORM 7.

The Cotton M'f'g Co Mill No. 3 At Brookside
Cloth Room Report for _____ ending _____ 19__

Warp Drawing In			Cloth Recd.		Yards per lb			Quality of Goods				Cloth Baled			
To be drawn	Re Drawn	Drawn In	Style	Cuts	Lightest	Heaviest	Avg	Washes	Black Oil		Total	Cuts	Yards	Pounds	Bales

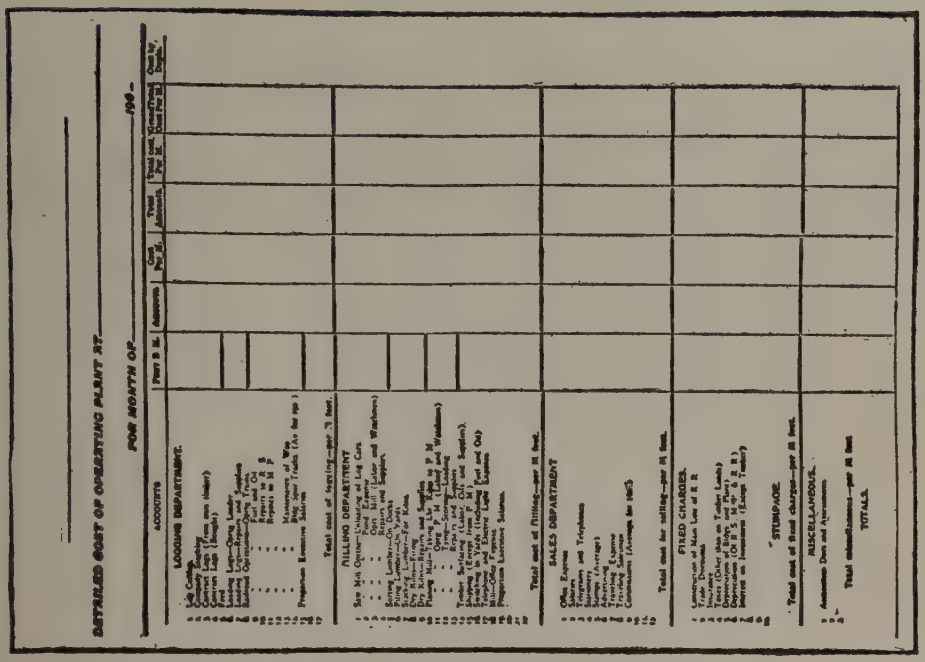
Special Matters	Waste	Supplies Received
Total Hands	Slasher Waste	
Picks Counted	Dust Room	
Seconds	Rags	
Harnesses Repaired	Broken Reeds	
Pay Roll	Worn out "	
	" Harnesses	
	Reeds Thrown out	

FORM 8.

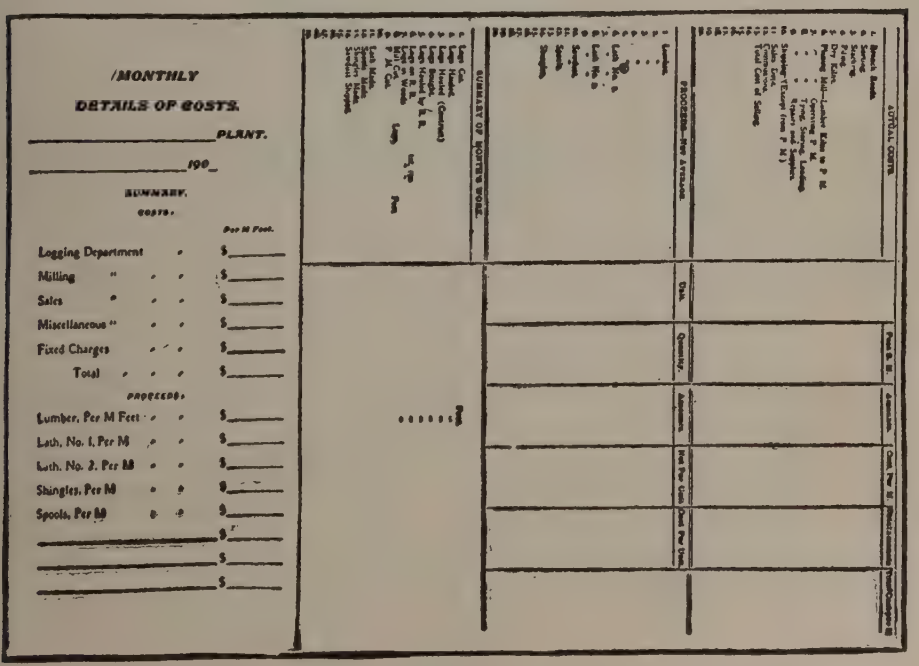
The Cotton M'f'g Co Mill No. _____
Cost of Manufacturing _____ Branch _____ ending _____ 19__

Departmental Cost	Prod. per Depart.	Labor Cost		Supplies		Oils		Repairs		Total Cost		Special Matters
Department	lbs.	Pay Roll	Per lb	Value	Per lb	Value	Per lb	Pay Roll	Per lb	Amt.	Per lb	Yarns Purchased and Sold
Carding												Yarns Purch'd
Mull Spg												No lbs @ $
Frame												
Spooling												
Warping												
Twisting												
Slashing												Yarns Sold
Drawing In												No lbs @ $
Weaving												
Cloth Room												
Bleachery												
Dye House												
Cloth Cost	cloth											Remarks
Carding												
Mull Spg												
Frame												
Spooling												
Warping												
Twisting												
Slashing												
Drawing In												
Weaving												
Cloth Room												
Bleachery												
Dye House												
Steaming												
Belt and Roll Shop												
Yarn and Watch												
Repairs												
Power												
Fuel												
Freights etc												
Light												
Water												
Taxes												
Insurances												
Salaries												
Incidentals												
Unclassified Expenses												

FORM 9.



FORM 10.



FORM 11.

COST SHEET for GENERAL EXPENSE
Month of _____ 190__

Acct No.		This Month		Last Month		Total Since Jan. 1st 190		Same Period Last Year	
		Amount	Per 1000 ft	Amount	Per 1000 ft	Amount	Per 1000 ft	Amount	Per 1000 ft
1	Salaries-Management								
2	" Clerks								
3	Stationery & Supplies								
4	Telephone & Telegraph								
5	Traveling								
6	Miscellaneous								
7	Special								
8	Association Dues								
9	Postage								
10	Legal								
11	Interest								
12	Insurance								
13	Taxes								
14	Depreciation								
15	Auditing								
16	Maintenance Office								
	Total,								

FORM 12.

COST SHEET for SALES EXPENSE
Month of _____ 190__

Acct No.		This Month		Last Month		Total Since Jan. 1st 190		Same Period Last Year	
		Amount	Per 1000 ft	Amount	Per 1000 ft	Amount	Per 1000 ft	Amount	Per 1000 ft
21	Salaries-Clerks								
22	Advertising								
23	Salesmen-A-Salaries								
	B-Expense								
24	Commissions								
25	Price List								
26	Postage & Stationery								
27	Telegraph & Telephone								
28	Miscellaneous								
29	Inspections								
	Total,								

FORM 13.

COST SHEET for WOODS EXPENSE
Month of _____ 190__

Acct. No.		This Month			Last Month			Total Since Jan 1st 190			Same Period Last Year		
		Amount		Per 1000 ft	Amount		Per 1000 ft	Amount		Per 1000 ft	Amount		Per 1000 ft
36	Superintendent - A - Salary												
	B - Expenses												
37	Swampers												
38	Cutting - A - Company												
	B - Contract												
39	Hauling A - Company												
	B - Contract												
	Average Swampers & Hauling												
40	Loading - A - Company												
	B - Contract												
41	Blacksmiths												
42	Feed												
43	Oil												
44	Repairs												
45	Surveyors												
46	Miscellaneous												
47	Fuel												
48	Special Crew & Roustabouts												
49	Grading												
50	Steel Gang												
51	Ties												
52	Section												
53	Log Inventory - A - Decrease												
	B - Increase												
54	Boarding car A - Loss												
	B - Profit												
	Total												
	Number Feet____ Number Logs____												

FORM 14.

COST SHEET for RAILROAD EXPENSE
Month of _____ 190__

Acct No.		This Month			Last Month			Total Since Jan 1st 190			Same Period Last Year		
		Amount		Per 1000 ft	Amount		Per 1000 ft	Amount		Per 1000 ft	Amount		Per 1000 ft
61	Train Crew												
62	Fuel												
63	Supplies												
64	Oil												
65	Repairs												
66	Damages												
67	Rent Locomotives												
68	Maintenance Main Line												
69													
70													
	Total												

FORM 15.

COST SHEET for ROLLING STOCK EXPENSE

Acct. No.		This Month		Last Month		Total Since Jan 1st 190		Total Since Jan 1st 190	
		Amount	Per 1000 ft	Amount	Per 1000 ft	Amount	Per 1000 ft	Amount	Per 1000 ft
71	Repairs-Cars								
72	Oil-Cars								
73	Repairs-Locomotives								
74	Oil-Locomotives								
75	Supplies								
76									
77									
78									
79									
80									
	Total								

FORM 16.

COST SHEET for MAINTENANCE EXPENSE
Month of 190

Acct. No.		This Month		Last Month		Total Since Jan 1st 190		Same Period Last Year	
		Amount	Per 1000 ft	Amount	Per 1000 ft	Amount	Per 1000 ft	Amount	Per 1000 ft
191	Terminals - A Labor								
	B Material								
192	Pond A Labor								
	B Material								
193	Saw Mill & Ramps A Labor								
	B Material								
194	Water & Steam Plant A Labor								
	B Material								
195	Machine Shop A Labor								
	B Material								
196	Dry Kilns A Labor								
	B Material								
197	Sheds A Labor								
	B Material								
198	Planing Mill A Labor								
	B Material								
199	Vehicles A Labor								
	B Material								
200	Dollyways A Labor								
	B Material								
201	Electric Plant A Labor								
	B Material								
202	Fire Protection A Labor								
	B Material								
203	Y.M.C.A. & Barn A Labor								
	B Material								
204	Burner A-Labor								
	B Material								
205	Grounds A Labor								
	B Material								
206	Miscellaneous A Labor								
	B Material								
	Total								

FORM 17.

COST SHEET for SHIPPING EXPENSE
Month of _____ 190__

Acct No.		This Month		Last Month		Total Since Jan 1st '10		Same Period Last Year	
		Amount	Per 1000 ft	Amount	Per 1000 ft	Amount	Per 1000 ft	Amount	Per 1000 ft
	Ramps								
171	Labor-A-Tallymen								
	B-Loaders								
172	Supplies								
173									
	Total								
	Number Feet								
	Sheds								
174	Labor-A-Foremen & Tallymen								
	B-Loaders, etc.								
175	Supplies								
176	Oil								
177	Teams								
178									
179									
180									
	Total								
	Number Feet								
	Average								
	Ramps								
	Sheds								
	Total								

FORM 18.

PEARL RIVER LUMBER CO
Brookhaven, Miss.
Comparative Statement of Plant Account
Month of _____ 190__

Acct. No.		Balance 1st of ____ 190__	Additions This Month	Additions Last Month	Balance ____ 31, 190	Balance ____ 31, 190
411	Railroad					
412	Rolling Stock					
413	Logging Equipment					
414	Pond					
415	Saw Mills					
416	Oil House					
417	Water and Steam Plant					
418	Planing Mill					
419	Dry Kilns					
420	Lumber Sheds					
421	Electric Plant					
422	Dolly Way					
423	Machine Shop					
424	Vehicles					
425	Live Stock					
426	Real Estate					
427	Office					
428	Office Fixtures					
429	Store Building					
430	Boarding House					
431	" " Furniture					
432	" " Woods					
433	Y.M.C.A.					
434	Barn					
435	Barber Shop					
436	Burner					
437	Extension Main Line					
438	Pattern Shop					
439	Gravel Pit					
	Total Plant Account					

FORM 19.

	Gluing
	Planing
	Sliping
Labor (making)	Rounding
Finishing	Sawing
Upholstering	Adzing
	Saddling
Running Expense - Per Cent ____	Sanding
Cost ____	
	Cost

Finishing	Stock			Labor			Upholstering
Process	Amount	Price	Amount	Hours	Price	Amount	Stock
Dipping							Velour
Stain							Pantasote
Filler							Fig Pantasote
Varnish							Damask
Brushing							Leather
Primer							Nails
Filler							Beading
Flowing Varnish							Filling
First Coat							Webbing
Second "							Springs
Rubbing							Fiber
Polishing							
Sanding							
Packing							
Stock							
Boxes							
Labor							Labor
Cost							Cost

FORM 20.

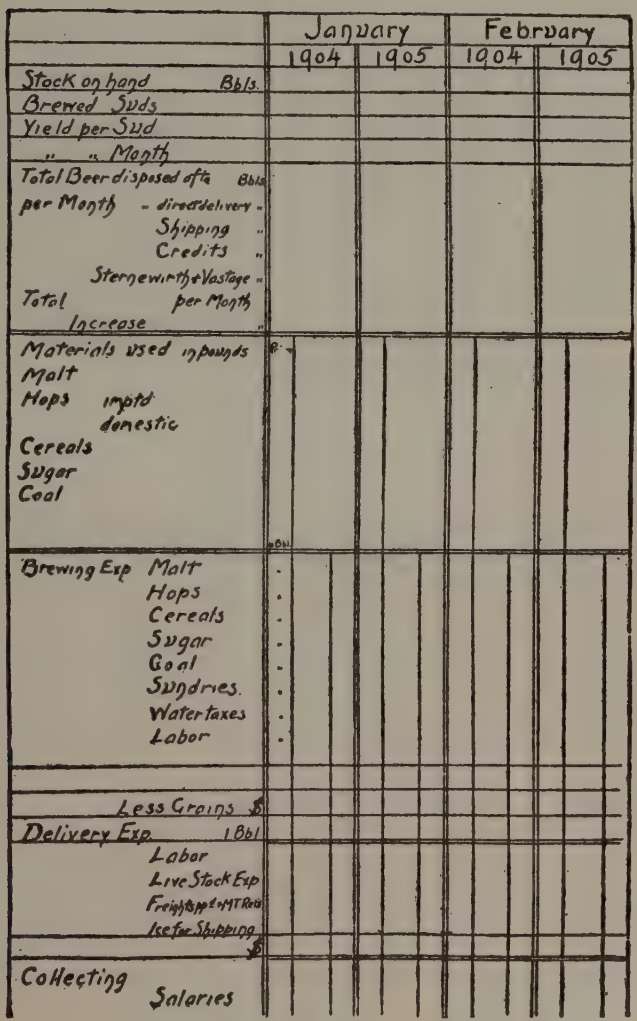
Recapitulation Sheet

Operating Expense	Cost	Mill Expense	Cost	Ditch + Power Expense	Cost	General Expense	Cost
Development		Labor		Labor		Mine Office	
Stoping		Supplies		Fuel		Home Office	
General				Material		Assay Office	

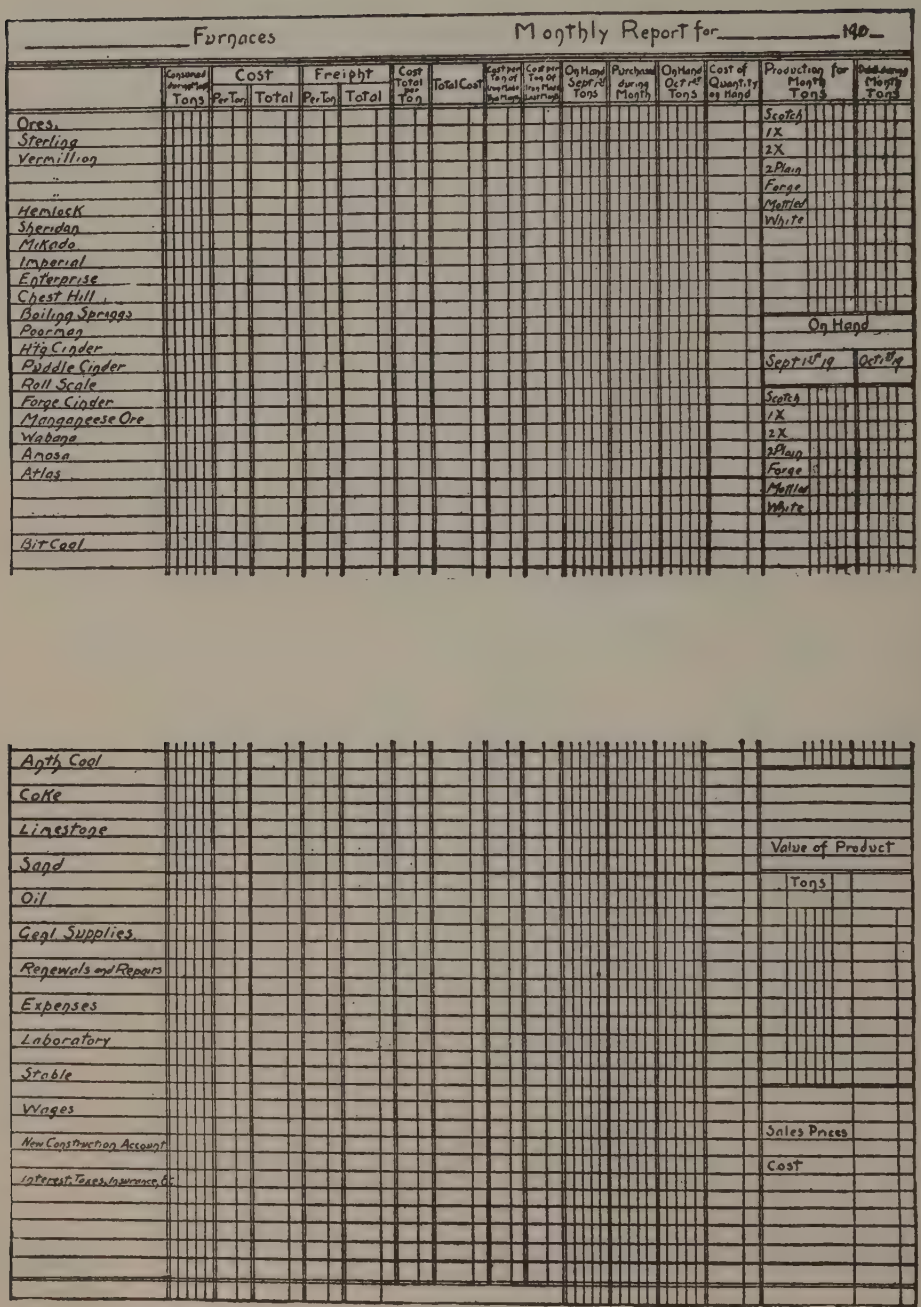
Pounds Sulphurets shipped to Smelter Value
Owners Bullion " " "
Pounds Sulphurets on hand "
Owners Amalgam "
Tons Ore mined and Shipped to Mill
Average Assay Value of Ore
Cost of Mining per ton
" " Milling "
" " Permanent Improvements for the Month
" " Office and Administration Expense for the Month

FORM 21.

Form 20 is the cost summary of a furniture manufacturing business. Form 21 is a summary devised for the gold mining business. Form 22 is the comparative summary of a brewery, and Form 23 is a record of furnace costs.

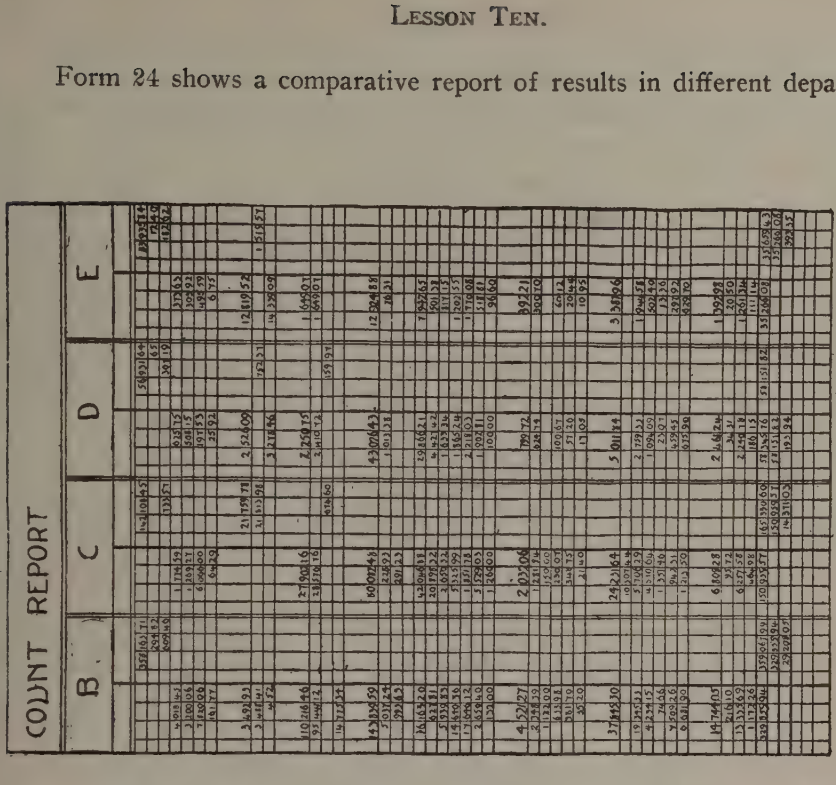


FORM 22.


Furnaces
Monthly Report for 190
Consumed during Month Tons
Cost Per Ton
Cost Total
Freight Per Ton
Freight Total
Cost Total per Ton
Total Cost
Cost per Ton of Iron Made During Month
Cost per Ton of Iron Made During Month
On Hand Sept 1st Tons
Purchased during Month
On Hand Oct 1st Tons
Cost of Quantity on Hand
Production for Month Tons
Sold during Month Tons
Ores.
Sterling
Vermillion
Hemlock
Sheridan
Mikado
Imperial
Enterprise
Chest Hill
Boiling Springs
Poorman
Htg Cinder
Puddle Cinder
Roll Scale
Forge Cinder
Manganeese Ore
Wabana
Amosa
Atlas
Bit Coal
Scotch
1X
2X
2 Plain
Forge
Mottled
White
On Hand
Sept 1st 19
Oct 1st 19
Anth Coal
Coke
Limestone
Sand
Oil
Genl Supplies
Renewals and Repairs
Expenses
Laboratory
Stable
Wages
New Construction Account
Interest, Taxes, Insurance &c
Value of Product
Tons
Sales Prices
Cost

FORM 23.

Form 24 shows a comparative report of results in different departments.



FORM 24.

(313) COST LEDGERS.

Forms 25 and 26 illustrate different methods of arranging cost ledgers.

Cost Ledger

OPERATING					REPAIRS				
Date	Description	Folio	Labor	Stores	Date	Description	Folio	Labor	Stores

FORM 25.

The latter form is used in the cotton manufacturing business. Form 25 would be improved by adding total columns, but the distinction between operating and repairs would be found very useful in many manufacturing businesses. Cost ledgers are frequently carried on the card system. One rather novel idea is to provide the Cost Ledger account on the back of a duplicate sales ticket,

Cost Ledger—Month of_____ 190__ Number of Working Days _____

Organization	Pat No.	Looms	Pounds	Yards	Amount	Cost per Pound	Cost per Yard	Remarks	Cost in Detail	Cost per Pound	Amt	Cost per Pound	Amt	Total Cost per Pound	Remarks
									Picking & Carding						
									Spinning						
									Weaving & Processes						
									Spec. Mach. Shop						
									Cloth Room, Mdse. Stor. &c.						
									Total Cost of Dept	extend	x	x	x		
									Fuel						
									Supplies						
									Genl Expenses						
									Taxes						
									Insurances						
									Salaries						
									Int and Disc						
									Total Other Cost			x	x		
									Total Cost of Mfg			x	x		
									Cotton Consumed — lbs	x	x	x	x		
									Waste Produced — lbs	x					
Total									Cloth Produced — lbs	x	x	x	x	x	

FORM 26.

thus recording full particulars in regard to the various items entering into the cost of production of the particular job to which the sales order refers. The charge to the customer's account may be made direct form this Cost Ledger account, the profit being added in the office, making the selling price, and the information for the file is thus very complete and conveniently arranged.

In modern manufacturing establishments the Cost Ledger is not always carried, this being supplanted by properly arranged Shop Orders and Cost Summaries. In any case the Cost Ledger would be the detailed record of the "Manufacturing Account" on the general books.

(314) PERPETUAL INVENTORIES.

A proper continuous Balance System of Cost Accounting necessarily involves a perpetual inventory. A good method of providing for this perpetual inventory is through a memorandum "Manufacturing Account," to be kept by the cost clerk, or whoever it may be, whose duty it is to attend to the factory records.

If daily job cards are issued to the workmen, a recapitulation may be made from them with an adding machine, and the total debited to this Manufacturing account. A recapitulation is also made of the value of material issued from the requisitions turned in by the stores-keeper, and the total of this recapitulation debited to Manufacturing account. As the shop orders are received on account of completed work, the value of material used and time consumed on them will be credited to Manufacturing account.

This account should be ruled on the debit side with two columns—one for material and one for labor, so that the total labor so far consumed on uncompleted work may always be available; and on the credit side with two columns,

Date		Order No ____ Direct Material	Supplies	Labor	Expense Percentage	Order No ____ Direct Material	Supplies	Labor	Expense Percentage	Total Debits	Completed Credit	Inventory
July	1											
	2											
	3											
	4											
	5											
	6											

FORM 27.

the second column providing for a record of unused material returned to the stockroom.

When reporting inventory of uncompleted work to the main office, it is only necessary to add the proper percentage of factory expense to the total labor, and the balance of this account then exhibits the required amount of the inventory.

Another plan where daily time tickets are used is to provide a form of cost summary, as per illustration, Form 27. The columns at the right of the form are:

(1) For the cross footing of the daily amounts entered under each job.
(2) Amounts of credits on account of completed orders.
(3) Inventory column, being the difference between the debit and credit columns.

As each job is completed and the credit entered in the credit column, that account is ruled off and a new one started underneath. This will work very satisfactorily in small establishments, but would not be practical where a large number of different shop orders are in process at the same time.

Where daily time tickets are not in use, it is necessary for the cost clerk to make the round of the factory each evening, and obtain the necessary figures from the workmen's sub-orders, or work tickets.

In further explanation of Form 27, it should be stated that the columns headed "material" and "supplies" refer only to the items entering directly into the construction of the goods. In the concern where this particular form is used, certain finished parts are purchased ready for use; these are, for convenience, classed as "supplies," while "materials" refers only to raw stock which is worked up in the factory. The class of supplies referred to would include such items as cabinet trimmings in a furniture factory.

This explanation is offered for the reason that, as ordinarily understood, the term "supplies" refers only to the general factory supplies and not to any materials entering directly into the manufacture of the goods. In the form referred to, this class of supplies is included in the expense column.

(315) CLASSIFICATION OF ACCOUNTS.

The proper distribution of accounts, either in factory, or general accounting records, is a matter of considerable importance, and exercises considerable influence on the graphic presentation of statistics to those who must be guided by them in the management of a business. We present a few examples of classification, or distribution, which appear to us to contain instructive features, and which will certainly suggest ideas of value to some of the subscribers to this course.

In one manufacturing establishment the operating expense is subdivided into 12 separate accounts, as follows:

(1) Superintendence, includes salaries of elected officers, superintendent and foremen, which are charged to the account from cash through the office pay-roll.

(2) Technical Department Expense includes salaries of all connected with the department except the draughtsmen, who are paid by the hour and charge their time directly to the numbered job on which they are working. Charges to this account are made from cash through the factory and office pay-rolls.

(3) Power and Light includes all expense connected with operation of the power plant. Labor is charged from cash through the factory pay-roll and supplies, including fuel, are charged directly from cash upon payment of invoices.

(4 to 8) Exploiting and Advertising, Travel, Legal Expense, Interest and Discount, also Office Supplies, include what their names indicate and charges to them are made directly from cash.

(9) Repairs, Insurance and Maintenance includes what the name indicates and charges may be made either from cash directly, in case of insurance or repairs purchased outright, or through stock and the factory pay-roll if repairs are made by persons connected with the factory.

(10) General Expense includes charges which cannot be made to other expense accounts, and which may come directly from cash or through stock and the factory pay-roll.

(11) Factory Tools includes all cutting tools, etc., which cannot be considered equipment and carried as an asset. Charges can only be made through stock and the factory pay-roll.

(12) Factory Supplies includes waste, oil, etc., and charges can be made only through stock.

(316) SHIPBUILDING BUSINESS.

The following is a classification used in the shipbuilding business:

A. Steel in hull
   1. Longitudinal and transverse framing and plating
   2. Decks
   3. Castings and Forgings
   4. Bulkheads
   5. Miscellaneous steel work
B. Cement, paint, tiling
C. Carpenter work
D. Joiner work
E. Outfit and equipment
   1. Fittings for handling whole ship
   2. Fittings for supply and discharge
   3. Fittings for interior communication
   4. Fittings for safety and protection
   5. Fittings for ornamentation
F. Boiler-room weights
G. Engine-room weights
H. Shaft-alley weights
I. Coal
J. Fresh water, stores, provisions
K. Crew, passengers, effects
L. Cargo

As seen, the classification takes as the basis the complete weight of distribution of a ship, and distributes even the trial-trip expenses to the items

J, K and L. The leading principle throughout the classification is to charge every possible expenditure to specific contracts and jobs, thus disposing of them when the contract is completed.

(317) MACHINERY BUSINESS.

We append the distribution of accounts in connection with a machinery manufacturing business, making its own castings:

PRODUCTION DEPARTMENT.

General Foundry Dept.—
1. Iron and Coke Charged
2. Breaking, Hoisting and Charging
3. Cupola Expense
4. Casting
5. Coremaking
6. Moulding
7. Helping Moulders
8. Flasks (up keep of)
9. Foundry Expense
10. Foundry Facing, Blacking (material and labor)
11.
12. Cleaning Castings
13. Loading Castings
14.
15. Productive Sales
16. Non-productive Sales
17.
18.

Pipe Foundry Dept.—
19. Brass Foundry Expense
20. Brass Foundry Production
21.
22. Iron Mixture
23. Pipe Cores
24. Pipe Moulding, Helping and Casting (labor of manufacture)
25. Pipe Cleaning, Dipping, Testing and Weighing
26. Pipe Expense
27. Pipe Production Sales
28. Pipe Non-productive Sales
29. Loading and Shipping—Pipe
30. Pipe Flasks

Machine Shop Dept.—
31. Machine Shop and Tool-room Expense
32.
33. Machine Shop Productive Sales
34. Machine Shop Non-productive Sales
35.
36.

Blacksmith Shop Dept.—
37. Blacksmith Shop Expense
38. Blacksmith Shop Productive Sales
39. Blacksmith Shop Non-productive Sales
40.
41.

Pattern Shop Dept—
42. Pattern Shop Expense
43. Standards—All standard patterns
44. Patterns—Patterns belonging to customers
45. Pattern Shop Productive Sales
46. Pattern Shop Non-productive Sales
47. Miscellaneous Pattern Expense

Miscellaneous Productive Sales—
48. Miscellaneous Productive Sales

NON-PRODUCTIVE DEPARTMENT.

General Expense—

49. Office Salaries
50. Office Expense
51. Engineering Department
52. Soliciting Expense
53. Legal
54. Advertising
55. Water
56. Taxes
57. Insurance
58. Interest and Exchange
59. Sundry General Expense
60. Discounts
61.
62.

Plant Maintenance—

63. Watchman
64. Stable
65. Engine and Boiler
66. Electrical
67. Yard
68. Buildings
69. Oils
70. Sundry Plant Maintenance
71.

Materials—

72. Wood
73. Coal
74. Coke
75. Pig Iron
76. Scrap and Sales
77. Scrap (metals) and Sales
78. Lumber and Sales
79. Merchandise and Sales
80. Babbit and Sales
81. Blacksmith Coal and Sales
82.
83.

Corporation Accounts—

84. Capital Stock
85. Capital Stock Discount
86. Real Estate and Improvements
87. Horse and Wagon Property
88. Tools, Machinery, Crane and Cupola
89. Flasks (stock)
90. Bills Receivable
91. Bills Payable
92. Cash
93. Dividends
94. Office Furniture and Fixtures
95. Pay Roll
96. Freight
97. Vouchers
98. Experimental
99. Betterments
100. Productive Sales
101. Non-productive Sales
102. Sundry Cash
103. Royalties
104. Profit and Loss

(318) THE IMPROVED BALANCE SYSTEM OF COST ACCOUNTING.

As above indicated, we recommend that particulars of cost of uncompleted orders be assembled on the cost summaries. The costs of completed orders are assembled from the shop orders. The costs of uncompleted orders are assembled from the daily reports obtained by the cost clerk or other official in charge of the cost statistics.

To the total of uncompleted orders obtained from the cost summary is added a proper percentage of factory expense and the amount thus obtained is then transferred either to the inventory, or by an adjusting entry is credited to the factory, or whatever similar account may be carried, and debited to Accounts Receivable or an account with uncompleted orders, as may be considered most advisable.

Percentages of factory expense are usually based on the amount of productive labor, but in shops where the greater part of the work is done by machinery tended by cheap operators, the machines should be treated as though they were operators, *i. e.*, the value of the work performed by them should be computed per hour by fixing a conservative rate of depreciation, thus avoiding the hour-plan of computing percentages, and all its disadvantages and inaccuracies.

The factory expense will then be exactly ascertained each month, including a proper proportion of fixed charges, such as insurance, rent, etc., and a percentage thus obtained may be used during the following month so as to permit of bills being mailed promptly to customers on completion of the work. The actual expenses will, at the end of each month, be compared with the estimated expenses based on the previous month's statistics, and any difference placed in an adjustment account, the same to be added to, or deducted from, the next month's percentages, as the case may be.

By this plan any differences between the factory books and the general books in regard to pro-rating shop expense will be adjusted each month, and it will, therefore, be possible for the two sets of records to absolutely balance, so far as shop expense is concerned.

With regard to general expense, a percentage of which is added to total cost for the purpose of fixing selling price, or ascertaining actual profit made on the work, we are not particularly interested in this department in this exposition of cost accounting, except to the extent that we would recommend precisely the same course to be adopted as recommended in regard to the treatment of factory expense, as by this means absolute accuracy is obtained, and a further balance with the general books is secured in dealing with such cost summaries as may be used to record percentages of administration and selling expense added to cost of production.

Where the factory is situated at considerable distance from the main office, it is customary to provide for purchases in records kept at the factory, and in this case it is necessary for the factory to keep an independent set of books. The accounts kept in the main office should be so arranged as to furnish a

check on the factory records by balancing with them in each particular department of manufacture.

An account should be kept with each kind of material used in the production of the articles manufactured, these accounts being debited with the totals from the purchase record at periodic intervals.

Copies of the requisitions made on the stores-keeper should be furnished to the main office, and the totals of monthly recapitulations of these requisitions credited to the raw material accounts. The balances of these accounts should then agree with the balances on the stores ledger, both in quantities and values. As above stated, it frequently happens that values are not extended on the stores cards, and in this case, values are entered on a separate inventory.

In some cases, the process of inventorying is continuous, the stores being divided into 26 sections, and one section being tested each day.

The plan to be adopted depends largely upon local conditions, and necessarily involves a certain amount of time, but the result will be that the material and supplies accounts on the general ledger in the main office will, at all times, balance exactly with the factory records.

The operation on the general books will be a debit to Manufacturing account, and a credit to the material account affected, the Manufacturing account thus representing uncompleted work. As the shop orders on completed work are turned in, these are credited to Manufacturing account and debited to Finished Goods account, or such accounts as represent finished goods of one kind and another.

The labor accounts are treated in a similar manner, and require no separate elucidation, the particulars obtained from the cost cards, together with the amount of unproductive labor, balancing with the regular pay-roll.

On the general books the factory would be charged with all the vouchers drawn by them, and credited with all the finished product shipped, or placed in the warehouse ready for shipment.

The factory should make up vouchers for all material purchased, or any other obligations incurred. These would be entered on the factory books, crediting the general books or main office, and debiting the proper accounts. These vouchers are then sent to the main office for payment.

The factory is supplied with a working fund, which is used for the payment of help, etc., and at the first of the month, or any other convenient time, a voucher is made for all disbursements during the month from this fund and sent to the main office, where a check would be drawn and sent to the factory, thus keeping the fund at a fixed sum.

Once a month the accounts, that is, the account with factory on the general books, and the account with the main office on the factory books, should be compared. If the entries have been properly made, the balances of these accounts should be the same.

The trial balance of both ledgers should be consolidated when it is desired to close the books.

In the consolidated trial balance the amount of the balance of the ac-

count with factory on general books, and the balance of the account with main office on the factory books would be eliminated, showing instead the debit balances standing on the factory books with raw material, labor, etc.

MAIN OFFICE TRIAL BALANCE.

Capital Stock		$50,000.00
Surplus		6,532.00
Real Estate	$ 2,000.00	
Plant	16,000.00	
Machinery	13,500.00	
Cash in Bank and Office	4,850.00	
Purchase Ledger		6,842.94
Sales Ledger	12,459.62	
Factory Account	14,565.32	
	$63,374.94	$63,374.94

FACTORY TRIAL BALANCE.

Main Office Account		$14,565.32
Raw Material	$ 8,364.86	
Labor	2,389.21	
Fuel	1,886.40	
Repairs	112.24	
Factory Expense	190.23	
Cash Working Fund	1,622.38	
	$14,565.32	$14,565.32

CONSOLIDATED TRIAL BALANCE.

Capital Stock		$50,000.00
Surplus		6,532.00
Real Estate	$ 2,000.00	
Plant	16,000.00	
Machinery	13,500.00	
Cash in Bank and Office	4,850.00	
Purchase Ledger		6,842.94
Sales Ledger	12,459.62	
Raw Material	8,364.86	
Labor	2,389.21	
Fuel	1,886.40	
Repairs	112.24	
Factory Expense	190.23	
Cash (Working Fund)	1,622.38	
	$63,374.94	$63,374.94

(319) DEMONSTRATION OF THE IMPROVED BALANCE SYSTEM.

For the purpose of presenting the Improved Balance System of Cost Accounting in as graphic a manner as possible, we submit the cost ledger of the main office in four sections, together with the controlling accounts of the said sections, carried in the general ledger. It will be noted from this illustration how the Manufacturing account is treated as a Work in Process account, thereby completing the balance on the general books, in connection with the controlling accounts and the Expense Distribution account.

The amounts to be pro-rated are transferred from the expense controlling accounts to the Expense Distribution account, so as to show exactly the total amount that needs adjustment.

GENERAL FOUNDRY DEPARTMENT

BREAKING, HOISTING, & CHARGING

DATE		F	DR	INVENTORY BALANCE	DATE		F	CR
JAN. 1 TO 31			425 —		JAN. 31			425 —

CUPOLA EXPENSE

DATE		F	DR.	INVENTORY BALANCE	DATE		F	CR
JAN. 1 TO 31			297 65		JAN. 31			297 65

CASTING

DATE		F	DR	INVENTORY BALANCE	DATE		F	CR
JAN. 1 TO 31			1327 30	119 60	JAN. 31			1407 90

CORE MAKING

DATE		F	DR.	INVENTORY BALANCE	DATE		F	CR
JAN. 1 TO 31			1715 —	326 25	JAN. 31			1498 75

At the close of January, it is found that the percentage of 40 per cent. falls short of the required amount by $248. In order to adjust this difference, therefore, the deficit is carried forward to the next month's business, making the balance of the Expense Distribution account $3,044.30.

With a view to adjusting the previous month's difference, the percentage of distribution has been increased to 41 per cent. on productive labor, amount-

GENERAL FOUNDRY DEPARTMENT (CONT'D)

MOULDING

DATE		F	DR	INVENTORY BALANCE	DATE		F	CR
JAN. 1 TO 31			1865 —	275 —	JAN. 31			1590

HELPING MOULDERS

DATE		F	DR	INVENTORY BALANCE	DATE		F	CR
JAN. 1 TO 31			276 —	51 18	JAN. 31			334 82

FOUNDRY EXPENSE

DATE		F	DR	INVENTORY BALANCE	DATE		F	CR
JAN. 1 TO 31			1355 —		JAN. 31			1355 —

CLEANING CASTINGS

DATE		F	DR	INVENTORY BALANCE	DATE		F	CR
JAN. 1 TO 31			128 75	18 75	JAN. 31			110 —

GENERAL FOUNDRY DEPARTMENT (CONTD)

LOADING CASTINGS

DATE		F	DR.	INVENTORY BALANCE	DATE		F	CR.
JAN. 1 TO 31			97 60		JAN. 31			97 60

ing to $3,108.78. This leaves a credit balance of $64.48, but in actual practice the adjustment might possibly be made within $10, according to the knowledge of the book-keeper as to prevailing and probable conditions.

It will be noted that the figures given in this demonstration are not intended to represent actual transactions in relation to any business, and must be considered purely from the accounting standpoint.

MATERIAL ACCOUNTS

NO. 2 PIG IRON

DATE		F	DR.	INVENTORY BALANCE	DATE		F	CR.
JAN. 1 TO 31			11368 45	2864 25	JAN. 31			8704 20

SCRAP

DATE		F	DR.	INVENTORY BALANCE	DATE		F	CR.
JAN. 1 TO 31			769 50	428 25	JAN. 31			341 25

COKE (COREOVEN)

DATE		F	DR.	INVENTORY BALANCE	DATE		F	CR.
JAN. 1 TO 31			1725 95	279 75	JAN. 31			1446 20

COKE (CUPOLA)

DATE		F	DR.	INVENTORY BALANCE	DATE		F	CR.
JAN. 1 TO 31			2654 32	592 50	JAN. 31			2061 82

MATERIAL ACCOUNTS (CONT'D)

LIMESTONE

DATE		F	DR.	INVENTORY BALANCE	DATE		F	CR.	
JAN. 1 TO 31			397 16	89 65	JAN. 31			489 61	

CORE SAND

DATE		F	DR.	INVENTORY BALANCE	DATE		F	CR.	
JAN. 1 TO 31			629 30	118 —	JAN. 31			511 30	

FLOUR

DATE		F	DR.	INVENTORY BALANCE	DATE		F	CR.	
JAN. 1 TO 31			198 50	75 —	JAN. 31			123 50	

PLUMBAGO

DATE		F	DR.	INVENTORY BALANCE	DATE		F	CR.	
JAN. 1 TO 31			78 75	15 20	JAN. 31			63 55	

MATERIAL ACCOUNTS (CONT'D)

LINSEED OIL

DATE		F	DR.	INVENTORY BALANCE	DATE		F	CR.	
JAN. 1 TO 31			29 60	18 60	JAN. 31			11 —	

MOLASSES

DATE		F	DR.	INVENTORY BALANCE	DATE		F	CR.	
JAN. 1 TO 31			35 75	4 25	JAN. 31			21 50	

LADELENE

DATE		F	DR.	INVENTORY BALANCE	DATE		F	CR.	
JAN. 1 TO 31			41 18	12 75	JAN. 31			29 43	

'SEA COAL

DATE		F	DR.	INVENTORY BALANCE	DATE		F	CR.	
JAN. 1 TO 31			276 50	28 50	JAN. 31			248 —	

MATERIAL ACCOUNTS (CONT'D)

MOULDING SAND

DATE		F	DR.	INVENTORY BALANCE	DATE		F	CR.	
JAN. 1 TO 31			234 95	57 25	JAN. 31			177 70	

GATES & REMELT

DATE		F	DR.	INVENTORY BALANCE	DATE		F	CR.	
JAN. 1 TO 31			219 50	61 18	JAN. 31			158 32	

BAD CASTINGS

DATE		F	DR.	INVENTORY BALANCE	DATE		F	CR.	
JAN. 1 TO 31			78 90	20 40	JAN. 31			58 50	

LUMBER

DATE		F	DR.	INVENTORY BALANCE	DATE		F	CR.	
JAN. 1 TO 31			376 50	102 45	JAN. 31			274 05	

MATERIAL ACCOUNTS (CONT'D)

PATTERNS

DATE		F	DR.	INVENTORY BALANCE	DATE		F	CR.	
JAN. 1 TO 31			762 75	615 75	JAN. 31			147	

PLANT MAINTENANCE

WATCHMAN-STABLE EXPENSE

DATE		F	DR	INVENTORY BALANCE	DATE		F	CR	
JAN. 1 TO 31			158 40		JAN. 31			158 40	

ENGINEERING EXPENSE

DATE		F	DR	INVENTORY BALANCE	DATE		F	CR	
JAN. TO			565 —		JAN. 31			565	

ELECTRICAL EXPENSE

DATE		F	DR	INVENTORY BALANCE	DATE		F	CR	
JAN. 1 TO 31			127 18		JAN. 31			127 18	

YARD

DATE		F	DR	INVENTORY BALANCE	DATE		F	CR	
JAN. 1 TO 31			201 15		JAN. 31			201 15	

PLANT MAINTENANCE (CONT'D)

BUILDINGS

DATE		F	DR	INVENTORY BALANCE	DATE		F	CR	
JAN. 1 TO 31			165 75		JAN 31			165 75	

SUNDRY PLANT MAINTENANCE

DATE		F	DR	INVENTORY BALANCE	DATE		F	CR	
JAN. 1 TO 31			37 50		JAN. 31			37 50	

GENERAL MANUFACTURING EXPENSE

GENERAL EXPENSE

DATE		F	DR.	INVENTORY BALANCE	DATE		F	CR.
JAN. 1 TO 31			1483 30		JAN. 31			748 19 735 11

MACHINE SHOP & TOOL EXPENSE

DATE		F	DR.	INVENTORY BALANCE	DATE		F	CR.
JAN. 1 TO 31			118 75		JAN. 31			118 75

BLACKSMITH SHOP EXPENSE

DATE		F	DR	INVENTORY BALANCE	DATE		F	CR.
JAN. 1 TO 31			77 50		JAN. 31			77 50

PATTERN SHOP EXPENSE

DATE		F	DR.	INVENTORY BALANCE	DATE		F	CR.
JAN. 1 TO 31			86 15		JAN. 31			86 15

CONTROLLING ACCOUNTS

GENERAL FOUNDRY DEPARTMENT

DATE		F	DR.	INVENTORY BALANCE	DATE		F	CR.
JAN. 31			6906 72		JAN. 31			6906 72
FEB. 28			7582 40		FEB. 28			7582 40

GENERAL MANUFACTORING EXPENSE

DATE		F	DR.	INVENTORY BALANCE	DATE		F	CR.
JAN. 31			1765 70		JAN. 31			1765 70
FEB. 28			1819 50		FEB. 28			1819 50

PLANT MAINTENANCE

DATE		F	DR.	INVENTORY BALANCE	DATE		F	CR.
JAN. 31			1244 98		JAN. 31			1244 98
FEB. 28			976 80		FEB. 28			976 80

MATERIALS

DATE		F	DR	INVENTORY BALANCE	DATE		F	CR.
JAN. 31			20260 66	5393 73	JAN. 31			14866 93
FEB. 28			12541 75	6549 89	FEB. 28			15991 86

CONTROLLING ACCOUNTS (CONTD)

EXPENSE DISTRIBUTION

DATE			F	DR.		INVENTORY BALANCE		DATE			F	CR.		
JAN.	31			1765	70			JAN.	31			2762	68	
				1244	98	DR 2	48 —	FEB.	28			3108	78	
FEB.	28			1819	50									
				976	80	CR 64	48							

FINISHED STOCK

DATE			F	DR.		INVENTORY BALANCE		DATE			F	CR.		
JAN.	31			19615	88									
FEB.	28			20811	68									

CONTROLLING ACCOUNTS (CONT'D)

MANUFACTURING ACCOUNT

DATE			F	DR		INVENTORY BALANCE		DATE			F	CR.		
JAN. TO	1	REQUISITIONS		14866	93			JAN.	31	COST TICKETS		19615	88	
	31	LABOR REPORTS		6906	72			FEB.	28			20811	68	
		EXPENSE		2762	68	4920	45							
		PERCENTAGE 40%												
FEB. TO	1	REQUISITIONS		15991	86									
	28	LABOR REPORTS		7582	40									
		EXPENSE		3108	78	5871	36							
		PERCENTAGE 41%												

(320) FACTORY SYSTEM FOR "THE NATIONAL PACKAGE CO."

The following section of this lesson is devoted to a description of a cost accounting system as installed by the factory specialists of the International Accountants' Society, Incorporated. A complete voucher system was already in use and as voucher records have been fully explained in the preceding lessons we will omit reference to them and confine this description to a copy of the actual report made to the managers of the business which we will call for convenience The National Package Company.

We will take up the various records and blanks required suggesting forms which seem adapted to the particular needs of the factory and explaining in each case the manner in which these records are to be kept.

PURCHASE RECORDS.

The blanks now in use, illustrated by exhibit A, seem to be entirely satisfactory, as does your plan of making these orders in triplicate. The original should, of course, go to the shipper; the second sheet becomes the office copy and the third sheet, from which the prices are omitted by means of a short carbon, is for the receiving department. We recommend filing the office copy in a tickler first, under the date on which an acknowledgment should be received and then file this ahead to the date on which the goods should be shipped. Each day copies filed under that date will be removed from the tickler and given the necessary attention, after which, if the goods have not been received, they will be filed ahead. In this way you can follow up an

PURCHASING DEPARTMENT

GENERAL ORDER BLANK, NATIONAL PACKAGE CO., DETROIT, MICH.

ORIGINAL.

Order Dated_____ 190____

To_____

You will please ship us the following goods and render us Duplicate Invoice, Omitting from same Prices, Quantities and Terms Time for Delivery_____ 190__ Ship Via_____ Notify us Promptly, if there is any part of this order you cannot Ship at Specified Time We must have a Definite Date of Shipment Promised.

THE NATIONAL PACKAGE CO.

PURCHASING AGENT

	DESCRIPTION OF ARTICLES

MENTION ON YOUR INVOICE ORDER NO A 200

EXHIBIT A.

order until it is filled. When the goods arrive, a report should be made to the office on the receiving clerk's copy of the order and from this the invoice will be checked. Since, in your case, the receiving clerk, stores-keeper, and cost clerk are one and the same man, the stores records will be made direct from the receiving clerk's copy before it is returned to the office. Should you find it advisable, as we believe you will, to permit the stores clerk to know the cost of materials, we recommend sending to him the invoice with the freight added; he can then make the necessary records of costs and return the invoice to the office.

STORES RECORDS.

One of the first requisites in your factory system is to place all stock and material of every description in the charge of a stores-keeper. So far as possible, the stores should be kept in a stores-room, although it is, of course, necessary to keep certain quantities of supplies in the factory. It is important, however, that the stores, wherever located, shall be in charge of a stores-keeper. You should establish and maintain a record of stores which will, at all times, furnish an inventory of materials on hand. In your factory we recommend dividing the supplies into two classes, viz.: raw materials and finished parts. Raw material, as its name implies, will include all materials which you purchase in the raw state and work up into your product. Finished parts include all of those parts which you purchase ready for use and which are merely assembled in the completed article.

For keeping the stores record, a card like Exhibit B is recommended. These cards are 5 x 8 inches in size and on them will be recorded all materials received or disbursed. A card is used for each article in stock and they should

KIND OR SIZE ____ UNIT ____ WT ____ HIGH ____ LOW ____ ORDERED ____

RECEIVED						DELIVERED			
DATE	FROM	QUANTITY	INVOICE	FRT. ADDED	COST PER UNIT	REQ. NO.	QUANTITY	AMOUNT	QUANTITY ON HAND

EXHIBIT B.

be filed alphabetically by the name of the article, first being divided into two classes as above suggested. Instead of the alphabetical guides, we recommend the use of blank guides, so that the names of materials or the classes can be written on the guides, thus making your own index.

For each article in stock, establish a low limit, placing this limit in the space indicated on the card. When any stores reach the low limit, a metal tab should be placed over the word "low" on the card and a notice sent by the stores-keeper to the purchasing agent. When he sends this notice, he should indicate the date in pencil under the word "ordered." The stores-keeper should make these reports on the form shown by Exhibit C, and we recommend making these in duplicate so that the stores-keeper can retain one copy for his files.

Date_____

PURCHASING DEPARTMENT

THE FOLLOWING GOODS HAVE REACHED THE LOW LIMIT

ARTICLE	LIMIT	ON HAND

Ordered_____

_____ PA

STORE-KEEPER

EXHIBIT C.

ORDERS AND BILLING.

The next question for consideration is that of handling the orders for the factory. Since all of your goods are made to fill orders received from your customers, we have combined the office records, factory orders and billing. For this purpose, we have been obliged to make some changes in your present system and recommend the use of the blanks shown by Exhibit D, there being five of these blanks. The first copy or original is the invoice. You will note that all instructions for the factory are written at the extreme left of this blank, which is perforated so that the invoice can be torn off and mailed to the customer without showing any of the instructions for the factory. The

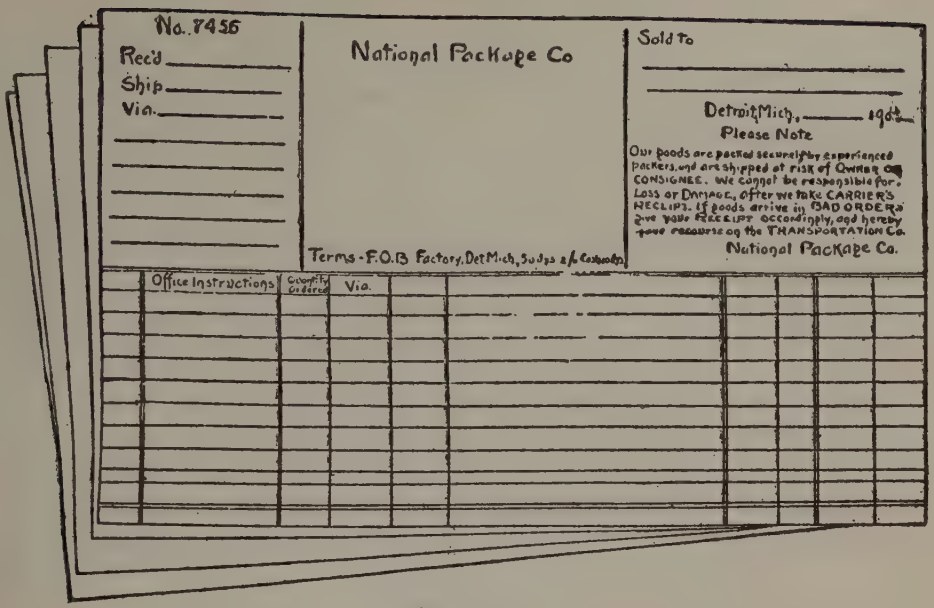

No. 7456
Rec'd
Ship
Via.
National Package Co
Sold To
Detroit, Mich., 190
Please Note
Our goods are packed securely by experienced packers, and are shipped at risk of Owner or CONSIGNEE. We cannot be responsible for Loss or Damage, after we take CARRIER'S RECEIPT. If goods arrive in BAD ORDER give your RECEIPT accordingly, and hereby have recourse on the TRANSPORTATION Co.
National Package Co.
Terms - F.O.B Factory, Det. Mich., Subject to Correction
Office Instructions
Quantity Ordered
Via.

EXHIBIT D.

second copy, which is merely a tissue sheet, is intended for the salesman and is to be sent to him as a record of his orders. The third copy is the shipping order for the use of your shipping clerk. When the goods are shipped, the shipping clerk will return his copy to the office, showing quantities, and this becomes a permanent office sales record. The items are extended on this copy and also entered on the invoice or original copy which is then ready for mailing. The fourth copy is for a private cost ledger and the fifth copy is the shop order, both of these copies have special forms printed on the back, the purpose of which will be explained later.

When the shop foreman receives an order, it will first be necessary for him to issue a requisition on the stores-keeper for material required. The form of requisition is shown by Exhibit E. Since the stores-keeper is also cost-keeper, two copies of this requisition will be sufficient, the duplicate remaining in the hands of the foreman. The requisition should, in each case bear the order number or show the purpose for which the material is to be used. The stores-keeper must not be allowed to issue material except on a written requisition signed by some one having authority to do so. The stores-keeper will, after entering the requisition on his stock records, retain the requisition which will be used by him as a basis for the material charge on the cost sheet. These requisitions will, in fact, furnish the cost clerk with a complete record of the materials used on a given order.

LABOR RECORDS.

To arrive at the proper labor charge on a given order, it will be necessary to ascertain the exact time spent on each order by each operator. After care-

REQUISITION No. DATE

STORE-KEEPER

, PLEASE ISSUE TO BEARER ACC'T.

THE FOLLOWING :

DELIVERED BY. DATE RECEIVED BY

EXHIBIT E.

TUBE DEPT

ORDER NO.

CLOCK NO.

TIME EMPLOYED COMMENCED

OPERATION HOURS @ COST

WINDING

CUTTING OFF

COVERING

LABELING

EXHIBIT F.

fully considering conditions in your factory, we recommend the installation of a device which mechanically records not only the time commenced but the time employed on a given job. To obtain these time records, it will be necessary to use time cards like those shown in Exhibit F. For the purpose of identification, we recommend the use of a set of cards of eight different colors, each color will be used for some specific department or class of work. We have divided these into the following classes: tubes, tin end cans, tin parts, fiber caps, assembling, packing and shipping, special jobs and non-productive labor. One of these cards is given to each operator for each job or order on which he works. If the operator works longer than one working period on the same order, he will receive as many time cards as he works days or fractions of a day. The operations indicated by these time tickets are mainly those on which you are paying by the day. For your piece-work records, the form shown in Exhibit G, which you are now using, seems to be entirely satisfactory, but for the convenience of the cost-keeper, we recommend transferring the amounts or quantities with the total cost to one of the regular time cards. Then, your piece-work record can go to the office where it becomes a pay-roll record without interfering in any way with the records of the cost clerk.

OVER-RUN AND CULLS.

We understand that in making the goods required on a given order, there will often be an over-run of perfect parts which can be used later and that there will also be a certain number of culls. In order to arrive at the exact cost of a given job it is, of course, necessary to ascertain the amount of over-runs and culls. Probably the most accurate method will be by weight. The cost of over-run of perfect parts will, of course, be deducted from the cost of the order and the parts put in stock and treated the same as finished parts purchased ready for use. The cost of culls should, in all cases, be included in the cost of the job, but it is important to ascertain the percentage of culls on each job, for the purpose of comparison. A report of over-runs and culls should be made by the inspector on the form shown by Exhibit H.

UNUSED MATERIAL.

Since it was practically impossible to issue the exact amount of material that will be required on a given order, a report should be made on the form shown on Exhibit I of all unused material. This material should be credited on the original requisition and put back in stock. It need not necessarily be taken back to the regular stores-room, but on the floor of the factory there should be a section where this unused material may be stored and there treated the same as material in the stores-room.

ASSEMBLING THE INFORMATION.

The cost clerk should, each day, collect all requisitions, time cards, reports of over-run and culls, and reports of unused materials. They should be assembled by order numbers. The most convenient method is to use card drawers and file these reports and time tickets between guide cards numbered

to represent the shop order numbers. We have made the largest of these blanks 4 x 6 inches in size which is a standard size card drawer. It is very important that all of these blanks be collected every day and placed in one of your vaults at night, as will be shown later. When the order is completed, the cost of material and labor, as shown by these reports and time cards, will be assembled on the back of the shop order, which is sheet No. 5, Exhibit D, after which the reports and time cards may be destroyed as they will be of no further value. When the costs are finally assembled on this form, the sheet should be delivered to the man who is to keep the private cost ledger which, in your case, we understand is the secretary of the company.

PIECE WORK

ASSEMBLING TYPE-A-CANS.

Order No._____ No. Cans Ordered_____

Style _____ Size _____

Hour Started_____ Date_____ 190__

Hour Finished_____ Date _____ 190__

Rate Per Schedule_____ No Packed_____

NAME		RATE	AMT.	TOTAL	REMARKS.
	_____M	@___			
	_____M	@___			
	_____M	@___			
	_____M	@___			
	_____M	@___			
	_____M	@___			
	_____M	@___			
	_____M	@___			
	_____M	@___			
	_____M	@___			
	_____M	@___			
	_____M	@___			
	_____M	@___			
	_____M	@___			
	_____M	@			
	_____M	@			

I hereby certify that the above account is correct.

Date _____

EXHIBIT G.

DATE _____

BELOW IS A CORRECT REPORT OF CULLS OVER RUN ON ORDER _____

_____

INSPECTOR

PART	LAST OPERATION	QUANTITY	COST	

EXHIBIT H.

DATE _____

RECEIVED UNUSED MATERIAL ISSUED ON ORDER _____ AS FOLLOWS:

_____

STORE-KEEPER

ARTICLES	QUANTITY	COST	VALUE

EXHIBIT I.

INDIRECT LABOR AND GENERAL EXPENSE.

The report received from the cost clerk by the secretary will exhibit the actual cost of material and direct labor consumed on the job but he must add the necessary amount to cover the items of indirect labor and general expense. Since in your factory the item of indirect labor is very small, we suggest combining these under the one head of "factory expense." We find that in your factory there is little variation in the cost of direct labor from month to month in comparison with the output of the factory, that is to say, a 25 per cent. increase in output usually means a 25 per cent. increase in the cost of direct labor. This being the case, we recommend basing the charge for factory expense on the cost of direct labor. First, open an expense adjustment

MATERIAL					LABOR				
Quantity	KIND	Unit Cost	Amount		OPERATION	Hrs.	Quantity	Rate	Amount
	Board				Tube Dept. Winding				
	"				Cutting Off				
	"				Covering-Labeling				
	"								
	Parchment Paper								
	Parchmyne				Fibre Caps-Lining				
	Fancy Paper				Dampening				
					Soaping				
	Tin Plate				Stamping				
	Sheet Zinc				Perforating Emboss'g				
	Nickelene								
	Labels				Metal Parts-Cutting				
	Seals				Stamping				
	Rivets				Perforating, Emboss'g				
	Spl. Tops				Riveting				
					Assembling Type A Assbl.				
					Labeling				
					Shouldering				
	Cartons								
	Lath								
	Box Shooks				Assembling Tin End Assbl.				
	Lining				Crimping				
	Nails				Special				
	Packing Cases								
					Packing & Shipping				
					Total Direct Labor				
	Total Material				Total Packages Assembled				
	" Direct Labor				" Shipped or Stored				
	% Factory Expense				Culls				
	Total Cost				% Culls				
	Less Material & Over-run								
	@								
	@								
	@								
	@								
	@								
	@								
	Total								
	Net Cost								

EXHIBIT D-5.

account in your ledger and charge to this account the items of expense properly chargeable to the operation of the factory during a given month. This expense adjustment account is necessary for the reason that many of your expense accounts are made up of items which must be distributed through the year. As an illustration, take the items of taxes and insurance; these are paid but once a year, but each month one-twelfth of the amount should be transferred to the expense adjustment account. To your labor account you are charging each month, the total amount of the pay-roll; this account will be credited with the amount of productive labor, as shown by the time tickets, and the balance which represents the indirect labor should be transferred to the expense adjustment account. Now we will suppose that during a given pay-roll period, your total pay-roll is $10,000.00; during the same

ESTIMATED COST MATERIALS					ACTUAL COST MATERIALS				
Quantity	Parts	Unit Cost	Amount		Quantity	Parts	Unit Cost	Amount	
	Fibre Tubes								
	Fibre Caps								
	Metal Caps								
	Spl. Tops								
	Packing								
	Total								
	LABOR								
	Tubes								
	Fibre Caps								
	Metal Parts								
	Assembling Type A								
	" Tin Ends								
	Spl.								
	Packing & Shipping								
	Total								
	Factory Expense								
	Total Cost								
						Value of Overrun Parts and Material			
						Net Cost per % Coils			

EXHIBIT D-4

period, the adjustment account amounts to exactly $1,000.00; dividing the latter by the former gives 10 per cent., therefore you would use this percentage for charging factory expense to each individual job, adding 10 per cent. of the cost of direct labor. This item will be added to the form Exhibit D-5, and the secretary will next make a summary of the cost on his private cost ledger sheet, Exhibit D-4, which is the fourth sheet in Exhibit D. You will note that on this cost sheet, we have provided for an estimated cost with another column in which will be entered the actual cost. When an order goes into the factory, the secretary will make up this estimated cost on the basis of the estimate when the order was taken, then when he has the actual and estimated costs side by side, he will have a valuable record to be used as a guide in making future estimates on a similar line of goods.

CONTROLLING ACCOUNTS.

To carry out The Improved Balance System, it will be necessary to open either in your general or private ledger, certain controlling accounts for the purpose of assembling the information shown by your factory records. If you carry the accounts recommended, it will enable you to maintain a perpetual inventory of orders in process, thus completing the balance between your factory records and the general ledger. The process is as follows:

Open an account in the private ledger to be called "Manufacturing account." Each day after the cost clerk has collected the reports, have him furnish to the office a report of the total value of material issued during the day. This item will be credited to your material account in the general ledger and debited to the manufacturing account. He will also report each day, the value of the material issued on orders which have been completed, this amount being credited to the manufacturing account and charged to the account "Finished goods." A report of unused material will also be made, the amount credited to manufacturing account and charged back to material account. The value of the over-run of perfect parts will be credited to manufacturing account and charged to the material account representing finished parts. In like manner the cost-keeper will make a report of labor as shown by the time cards, this amount being credited to labor account and charged to manufacturing account. The total cost of labor on jobs completed during the day will be credited to manufacturing account and charged to finished goods account.

The item of factory expense is handled as follows: As hereinbefore explained, factory expense is charged on a percentage basis. Now we will suppose that we are using 10 per cent. At the end of the month, the expense adjustment account will be credited with 10 per cent. of the direct labor as shown by the charges on the completed jobs for that month. This amount will be charged to manufacturing account. In like manner, the total amount of expense charged on individual jobs will be credited to manufacturing account and charged to finished goods account.

Since the expense items vary slightly from month to month, there will be small balances in the expense adjustment account which can be adjusted in the following month. For instance, we will suppose that last month the exact percentage of expense to direct labor was 10 per cent. and that we have been using that percentage this month. When these accounts are finally posted at the end of the current month, we find that we have charged too much for factory expense on the current month's jobs. We will be obliged to re-adjust our percentage next month, possibly using 9½ per cent., or, if we have charged too little, it may be necessary to increase our percentage to 10½ per cent. or 11 per cent. This is really the purpose of the expense adjustment account, for it shows us each month the exact expenses and also the exact amount which we have been charging to individual jobs so that we can adjust the differences monthly instead of waiting until the end of the fiscal year, only to be disappointed with the showing made by the balance sheet.

At the end of the month, these various accounts will exhibit the following statistics: The material accounts, both raw and finished parts, will show the exact value of material on hand. The labor account will be balanced since all direct labor has been charged to manufacturing account and the balance, representing indirect labor, carried to the expense adjustment account. The manufacturing account, to which has been charged the total cost in material, labor, and expense, on all work done in the factory during the month, and which has received credit for the cost in material, labor and expense of all orders completed during the month, will show the exact cost of partially finished goods in process. The finished goods account having been debited with the cost of all goods completed during the month, and being credited with all sales at cost, will show the exact value of finished goods in stock.

It is a well-known fact that the records of material and direct labor are comparatively accurate in most cost systems, but the trouble lies in the fact that these items are not balanced with the general books monthly. The accounts described above will enable you to maintain such a balance and to know that you are at all times charging to individual jobs the correct amount for factory expense.

EXERCISES.

1. Exemplify general method for keeping cost record of articles manufactured and submit illustrations of general cost summary, including columns for indirect labor and shop expense.
2. Describe the difference between a cost card and cost summary.
3. Furnish sketch of cost summary for a small business, providing for a record of selling expense and net profit.
4. Explain in your own language why general office and administrative expense should not be included as a part of cost of production.
5. Exemplify general methods for treatment of partially completed articles for inventory purposes.

6. Explain your knowledge of the difference between the percentage plan, man-hour plan, machine-hour plan, and tool-rate plan.

7. In a large construction business there are about 200 orders running per month. Some of these jobs are for small amounts, and some for large, some run for a year before being completed, and some are completed in one day.

The labor is divided into—machine shop; smith shop; carpenter shop and electrical shop.

General shop expense is pro-rated at the rate of 10% to each shop on completed work.

The material and labor is reported and listed each day on the different jobs.

A perpetual inventory is desired, showing amounts invested in uncompleted contracts.

Required—Design a form of summary, covering the work on each job during each month; the distribution of the labor to the various shops in respect of each job for each month; the record of value of material and labor on uncompleted work; a record of the amount of percentages added to cost of completed jobs, and total cost of same.

8. Where factory and general office are in the same building, what is the proper treatment of rent?

9. Where factory is owned by a single proprietor drawing no fixed salary and he is actively engaged in the management of the factory, should anything be charged against production on account of his services? Why?

10. The statistics of a manufacturing establishment are as follows for a period of three months:

JANUARY–MARCH.

Inventory—January 1	$18,000
Material issued from stores-room	9,000
Productive Labor as per pay-roll	11,000
Unproductive Labor and Factory Expense	1,900

COMPLETED JOBS.

Material Reported to Office	$ 5,000
Productive Labor Reported to Office	6,500
Fixed Charges for Period, including Depreciation of Machinery	1,250

The fixed charges for the preceding three months amounted to $1,375; the factory expense amounted to $1,600; the productive labor amounted to exactly the same as for the current period.

In accordance with the method outlined in this lesson, estimate the percentage of expense to apply on the January-March work. Adjust the difference between the estimated expense and the actual amount of said expense as ascertained at the end of the period.

Show agreement of factory books, or records, with the general books in respect to the charges made against the factory for productive labor, indirect labor and factory expense.

LESSON XI.

COST ACCOUNTING AND SYSTEMATIZING.

DEVISING ACCOUNTING SYSTEMS FOR DIFFERENT CLASSES OF BUSINESS.

LESSON XI.

Cost Accounting and Systematizing.

(321) DEVISING SPECIAL SYSTEMS OF ACCOUNT.

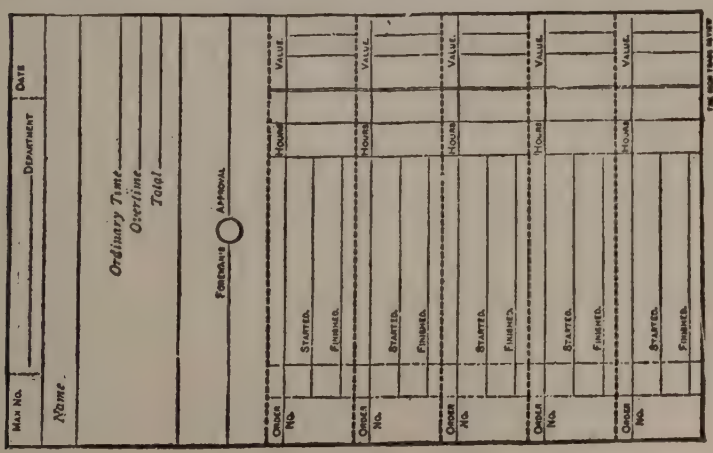
The object of this lesson is to illustrate or indicate the reason why different forms of record are necessary in different businesses working under different conditions. The dissimilarity between the requirements of a cotton mill and a foundry is obvious, as also that between a retail and a manufacturing establishment. Piece work and day work must be looked after by suitable recording methods, and the conditions of a cheese factory are by no means like those existing in a special machine shop.

(322) CHEESE FACTORY.

A cheese factory belongs to the class where quantities of the same kind of article are manufactured. If it is the manufacture of what is called "Table Cheese" to be supplied to the trade in jars, the process of cleaning, grinding, mixing with butter, sugar and salt, compressing, filling, and packing, are continuous. These operations are treated as separate departments, and because they are executed at the same time, the factory is termed a "continuous process" one, and the shop order must follow the work from one department to another until completion.

The raw material to be used in the production of certain quantities of table cheese can be accurately computed, the labor can be sectionalized by departments, and there is no difficulty in distributing the factory expense. Therefore, an important feature is the establishment of a standard unit with which the production of each shop order is carefully compared, such comparison immediately detecting any unjustifiable increase, either in raw material used or labor performed.

In this business a good plan is to arrange the shop order on the coupon plan, one coupon for each department, and each coupon being detachable by

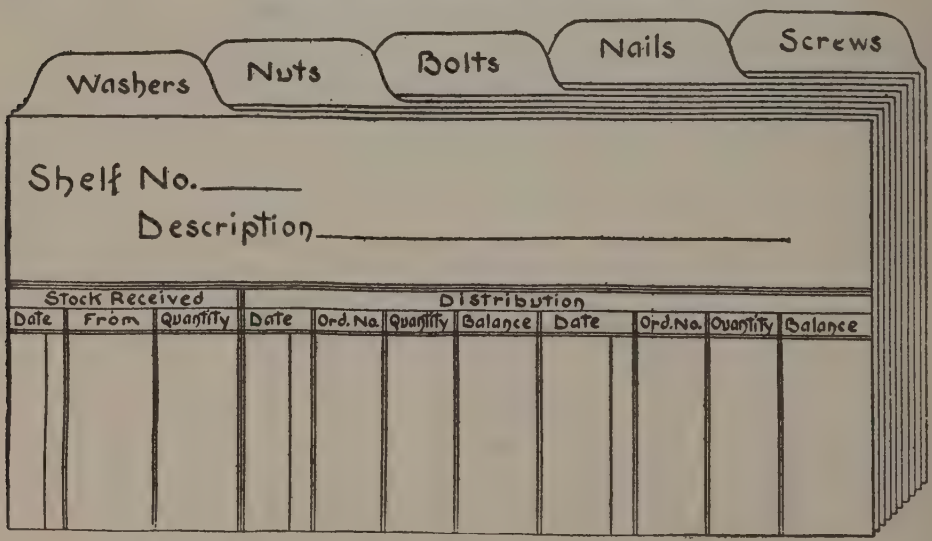


perforation. Thus, the coupon at the bottom of the order would be Cleaning Department, so that when the work in that department is completed the shop order is transferred to the Grinding Department and the Cleaning Department coupon detached and sent to the office.

(323) SMALL MACHINE SHOP.

Not only is there marked dissimilarity in the requirements of a cheese factory and a special machine shop, but interesting contrast may be found between the latter and a small machine shop, ranking in class 1 because the principal work performed is the assembling of certain standard machines, the castings and other principal parts of which are purchased complete outside. Bolts, nuts and tools are the principal purchases besides the completed parts mentioned, and we will suppose that the concern also carries a large repair department in connection with these machines.

The principal records in this business are those connected with the carrying out of orders received either for new work or for repairs. Purchases consist of completed castings received from foundry, supplies, such as bolts, nuts, washers, etc., and tools, which have frequently to be replaced. Owing to the nature of the supplies above mentioned, they are generally stored in shelves, or tiers of small compartments, and we would recommend a card system of record for these supplies, recording amount received, location of shelf, and amount taken out by foreman for use on jobs. See Form 1.



FORM 1.

Accounts are kept in the Ledger with Manufacturing, Repairs and Tools. To Manufacturing account is debited raw material, general supplies, castings and shop wages. As separate statistics are required in regard to Repairs, materials and supplies used on these jobs are credited to Manufacturing account and charged to Repairs. The same applies to labor while all tools pur-

chased are charged to Tools account. The difference between the balance of this account and the actual inventory taken at the close of the year should be credited to Tools account and charged to Profit and Loss.

In order to keep track of material and supplies used and time occupied on the various jobs, we recommend the use of a duplicate combination order and charge sheet, as illustrated in Form 2.

On receipt of instructions from customer the order sheet is made out in the office, entering thereon:

Date,
Our order number,
Customer's order number,
Name and address,
When promised.

The duplicate is then handed to the foreman of the shop, who arranges for the work to be done, the original order sheet being retained in the office.

RANSOM, BUHL & Co.
DETROIT, MICH.
ORDER SHEET.

Order No._____ Date_____
Customer's Order No._____ (Quote on bill)
From_____ REPAIRS
Address_____
When promised_____ When delivered_____

Material and Supplies used

Time occupied

Total Cost
Profit

FORM 2.

The foreman will enter on the order sheet the quantity of material and supplies used and particulars of time occupied. Special castings ordered for the job will be entered on the order sheet retained in the office. When the job is finished, the cost of material, supplies, and time occupied, is entered in the

first money column, the footing of which will give total cost of the job, and the profit made on the order can then be figured as indicated on the order sheet, thus furnishing an excellent check on estimates on which prices may have been made as well as forming a valuable current record.

The manufacturing account, with inventory (including uncompleted work) will always show profit on new orders, thus—

DEBITS.

Inventory, Jan. 1st.
Purchases.
Wages.
Shop Expense.

CREDITS.

Repair Credits.
Sales.
Inventory, Feb. 1st.

A separate account should, however, be kept with sales, which will then record total charges in respect to new orders completed.

The Repairs account will show profit on repair jobs executed.

A recapitulation may be made from the shop orders at the end of each month and agreed with the balance of the manufacturing account.

(324) MANUFACTURE OF MACHINE TOOLS.

As a contrast to the above, we present here a short and simple system of cost records for the construction of machine tools, illustrating the methods employed by the factory managers, and showing, as near as possible, the exact results in the most consistent manner, excluding details that cost more than the beneficial profit in their finding. The plan of organization is as follows:

Board of Directors
General Manager
Superintendent of Works
Superintendent of Production
Chief Engineer
Purchasing Agent

The directors authorize the construction of all product, specifying the quantity and the date to be completed, and communicate with the plant through the General Manager. The plant is divided into four divisions, and the four men in charge with the General Manager comprise the Factory Board of Management.

The Superintendent of Works looks after the keeping up of the entire plant, installing new equipment and plant construction.

The Superintendent of Production looks after the construction of the tools.

The Chief Engineer looks after the designing, drawings, and changing the designs of the tools.

PRODUCTION ORDER

When properly signed this is authority to make up product as specified

Mach No. _____ Lot No. _____ Date Issued _____ Date to be Completed _____

Specification Serial No. _____ Date Effective _____ Number to be Made _____

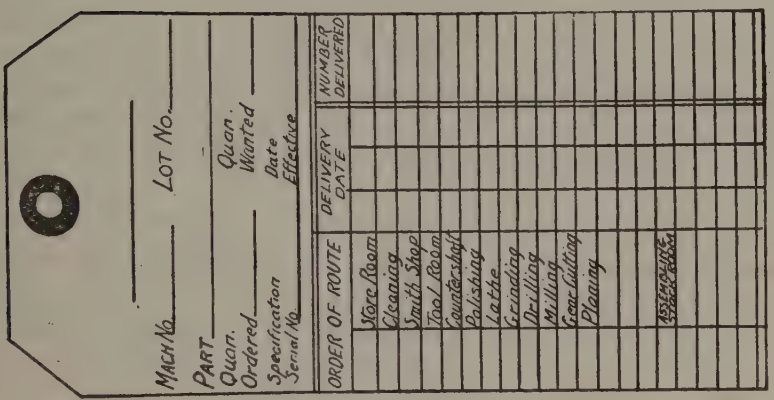
_____ General Manager

_____ Chief Engineer

Date Completed _____

_____ Supt. of Production

FORM 1.



FORM 2.

The Purchasing Agent keeps the plant supplied with material and supplies and looks after the testing and experimenting for determining the best material to use for the different purposes.

The division of the factory into departments is shown by Form 2.

Each different machine made is represented by a number and each part in that machine has the same number affixed, by a dash, with the number representing the part. Each machine is made from standard specifications, showing the different parts, kinds of material, and quantities, and the operations to be performed to complete the machine ready for the market. Each specification is marked with the machine number, serial number of the issue, and the date effective.

The illustrations and forms are more particularly adapted to the plan of building tools complete in lots, *i. e.*, all the parts of a machine necessary to make up a specified number of the machine are made at one time on one order.

The plan adhered to is the "man-hour on productive work," on the ground that this and the percentage plan are superior to other plans. It is admitted that there is less work with the percentage plan and in some factories it might produce as good results. But, where the rates of wages vary for men doing the same work the man-hour plan would seem the better, men at 27½ cents performing work in the same time as men at a higher rate, say 37½ cents,

creating the same factory burden for a portion of the productive work with a variation in the prime cost. The more skilled and higher rate men are essential for turning out part of the work and to keep them employed and have them when needed a portion of their time will be put in on work that a cheaper man could do as much of in the same time. With such conditions prevailing throughout a factory the hour plan affords a more even distribution of the factory expense over the productive work.

ISSUING ORDERS.

After authorization by the Directors the General Manager issues the order on Form 1, making as many copies as are required for distribution to the different departments affected, and turns them over to the Chief Engineer. If it has been decided to make any changes in the design of the next lot the Chief Engineer will issue another series of specifications with the necessary prints and attach to the order, and then distribute copies to the Superintendent of Production, Purchasing Agent, Storeroom and Cost Department.

ROUTING, HANDLING MATERIAL AND FOLLOWING UP.

A routing record for each part is kept in the office of the Superintendent of Production, and when orders are received on Form 1 the routing clerk fills out as many of Form 2, which is printed on a buff tag, from this record as required and sends them to the storeroom to be attached to the castings when received from the foundry and deliver to the department marked "1." After this department has finished the work in accordance with the specifications the parts are ready for delivery to department marked "2," and so on until the parts are delivered to the stock room of finished parts.

DEFECTIVE MATERIAL

Mach No_____ Lot No _____

Part _____

Kind of Material _____

No of Pieces _____ Weight _____

Cause _____

Date _____ _____

ISSUED IN DUPLICATE INSPECTOR

FORM 3.

SPOILED MATERIAL

Mach No_____ Lot No _____

Part _____

Kind of Material _____

No of Pieces _____ Weight _____

Cause _____

Date _____ _____

ISSUED IN DUPLICATE INSPECTOR

FORM 4.

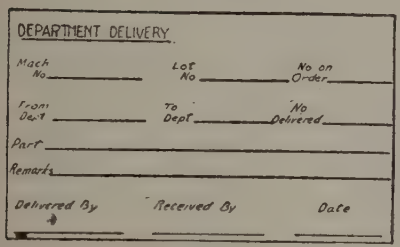
When defects are found in any of the castings Form 3 is made out in duplicate, and the castings accompanied with the duplicate form are returned to the storeroom, and the original form is sent to the Cost Department for credit.

When a piece is spoiled Form 4 is used in the same manner as Form 3.

Should a department finish a lot of pieces with a less number than wanted as shown on Form 2 the routing clerk is notified and a red card, the same as

Form 2, is made out and sent to the storeroom. The work on pieces with a red tag attached takes precedence over the work on pieces with a buff tag until they catch up to the original lot and are then kept along with the lot. If considered advisable work will be stopped until the shortage can be made up. A report of the red tags issued is sent to the Cost Department, which forms a record of the defective and spoiled parts that are replaced.

In this manner the lots of parts are finished with the required quantity for assembling complete the number of machines called for on the original production order, Form 1.


DEPARTMENT DELIVERY

Mach No _____ Lot No _____ No on Order _____

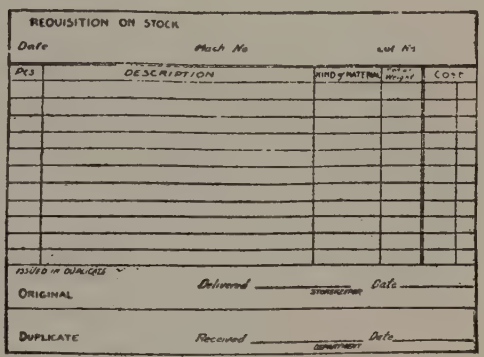
From Dept _____ To Dept _____ No Delivered _____

Part _____

Remarks _____

Delivered By _____ Received By _____ Date _____

FORM 5.


REQUISITION ON STOCK

Date _____ Mach No _____ Lot No _____

Pcs	DESCRIPTION	KIND OF MATERIAL	WEIGHT	COST

ISSUED IN DUPLICATE

ORIGINAL Delivered _____ STOREKEEPER Date _____

DUPLICATE Received _____ DEPARTMENT Date _____

FORM 6.

Form 5 is for reporting the delivery of lots from the department finishing to the next department, keeping the Superintendent of Production promptly advised of the progress in the work, and any lot not coming through fast enough can be followed up. By filing this report under the number of the part at any time any lot can be instantly located in the factory.

Form 6 is for reporting miscellaneous material taken from stock. The department requiring the material makes out the form in duplicate sending the original to the storeroom, and after the material is supplied and a credit made on the stock card it is sent to the Cost Department. When the material is received in the department the duplicate is checked and sent also to the Cost Department. The original is used for compiling costs and the duplicate is a check and proof of the material passing from the storeroom to the department after which the duplicate serves other purposes; for example, it is desirous at times to check a portion of the stock cards kept by the store-keeper and for this purpose they can be filed and retained for a period. This duplicate causes little additional work and expense and is of assistance in compiling the costs and in securing the careful and accurate handling of the stock cards, which, to bring about in any other manner, would necessitate more work and expense.

RECORD OF STOCK.

The storeroom is divided into five divisions—Castings, Miscellaneous Material, Supplies, Finished Parts, and Finished Machines, and Form 7 is a general record card for these five divisions of stock. The storekeeper is not burdened with the keeping of prices and extensions of value and is only responsible for the transactions of quantities. Each part has an established cost and selling price which is kept up between the cost and sales departments. Inventoring is practically the only time the cost of any quantity on hand is

STOCK RECORD

Part. Name _____ No. ___

Mach No _____ For Mach _____

Kind of Material _____ Weight each _____

SEC.	SHELF DRAWER	MAX	MIN

ORDERED		RECEIVED		DELIVERED		ON HAND
DATE	QUANTITY	DATE	QUANTITY	DATE	QUANTITY	QUANTITY

FORM 7.

ORDER OR MACH NO.	LOT NO	NO PCS IN LOT

PART

OPERATION

WORKMAN'S NO

EQUIP NO. DATE

DATE	A. M.		P. M.		OVERTIME		TOTAL
	IN	OUT	IN	OUT	IN	OUT	
16							
1-17							
2-18							
3-19							
4-20							
5-21							
6-22							
7-23							
8-24							
9-25							
10-26							
11-27							
12-28							
13-29							
14-30							
15-31							

RATE HOURS

AMOUNT $

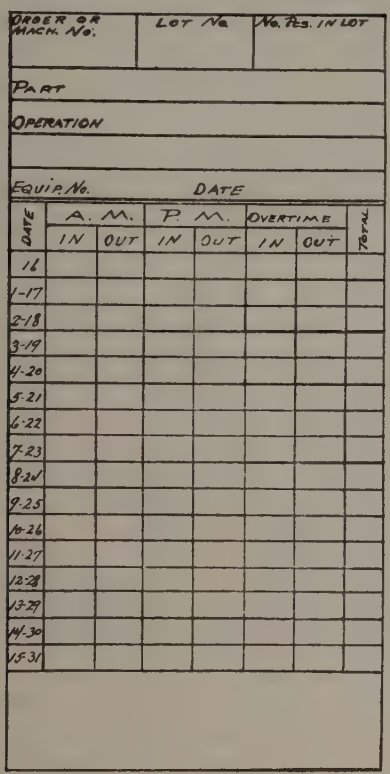
FORM 8.

required, as reference is usually made to the cost of a lot or piece and the information is given by the Cost Department. By having regular inventory forms the quantities are entered from the stock cards and the cost prices of the finished parts put on by the Cost Department, and of the material and supplies by the Purchasing Department, thus completing the inventory with little time and expense. The principal feature in this plan is the eliminating of duplicate records and work. Periodically, and as the purchase price of material changes, the Cost Department is advised so that it can correctly figure the costs. There is no space for recording the order numbers from which the material is ordered and delivered, for it is of little or no value with the described plan of taking material from stock, and is left off to save time and simplify the record work.

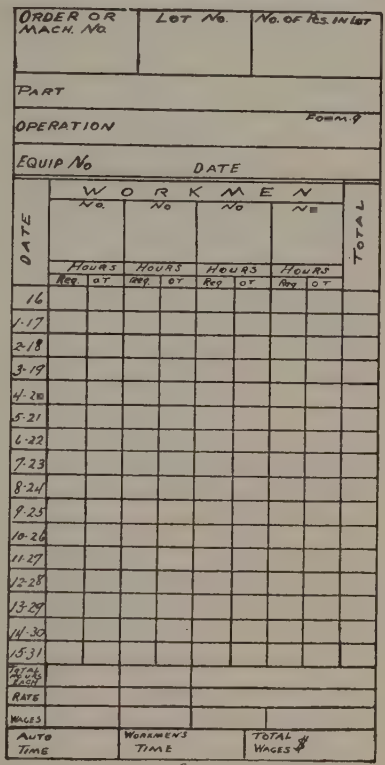
Lesson Eleven.

RECORDING TIME.

Forms 8 and 9 are used with an International Time Recorder for recording the time of each operation. Workmen are given numbers which are used instead of their names. These cards show the order or machine number, number of the lot, number of pieces in the lot worked on, number of or name of the parts, kind of operation, the (equipment number) machine it was performed on, workman's number and the date of finishing the operation.



Form 9. Obverse.



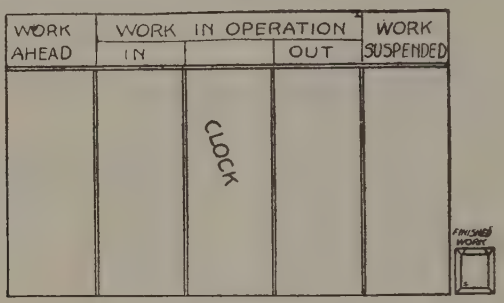
Form 9. Reverse.

Form 8 is used for recording all time other than time connected with automatic machines, and Form 9 when one man operates more than one automatic machine with or without helpers. The card is stamped for the time each machine has run, and the time of the men is pro-rated for each machine. The total time of the machines less the time of the men is the automatic time, or machine-time in excess of man-time.

Form 10 is a diagram showing an arrangement of racks for holding the operation cards. Different sizes are used according to the number of men in the department.

When Form 2 is received in the departments, Forms 8 and 9 are made out and placed in the "work ahead" racks under the number of the man wanted to do the work, and the parts are placed on the floor near the machine.

The " work ahead " rack should be checked often enough to insure each man being allotted with plenty of work. As soon as an operation is finished, the workman takes the card from the " in " rack, stamps the time in the " out " column and places it in the " finished " box; then takes the top card under his number in the " work ahead " rack, which is the next job he is wanted to do, stamps the time in the " in " column and places it under his number in the " in " rack under " work in operation." As the workmen leave the works or stop work at noon and night they take the cards from the " in " rack, stamping them in the " out " column and place them under their numbers in the " out " rack, and vice versa on resuming the operation. When work is stopped the operation cards are placed in the " work suspended " rack.



FORM 10.

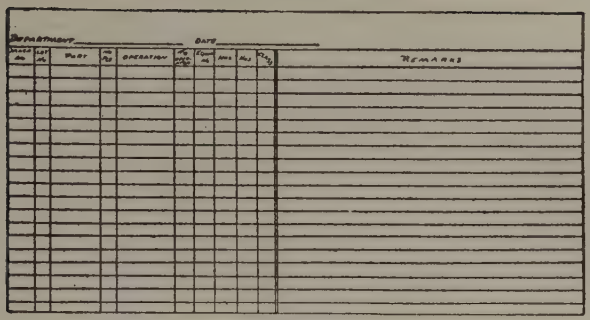
As fast as the operations are finished, they are inspected and, if satisfactory, the operation card is stamped " inspected " and placed in the mail for the Cost Department. The Cost Department receives the time classified and subdivided for making advantageous comparisons and accurate compilations of the total cost of each machine. On the reverse side of Form 8 unavoidable delays causing excess time are stated for information in making comparisons.

Time studies are made and a standard time established for each operation and put on a small card, filed under the name of the part and indexed so it can be referred to instantly. Each foreman has a complete list of this time for the operations in his department, and in a practical manner follows up the time as it is being put in, keeping it down to a minimum.

A card is kept crediting and charging each man with good time and slow time and is important in treating fairly with the men, in selecting and retaining the best men and placing them advantageously.

COMPARISON OF TIME.

Each morning the Superintendent of Production gets a report on Form 11 comparing the time of the operations finished on the previous day with the established time. For convenience in working this comparison, the rates paid are classified, *i. e.*, rates from 15 cents to 20 cents class " A "; from 20 cents to 25 cents, class " B," etc. The established time being set from a fair operation, the class of the man doing the work would be one cause for a difference in the time, and is answered by this simple classification; if the time is still



FORM 11.

unsatisfactory and there are no reasons given under the remarks to justify the difference, it will show the operator was slow.

FILING OF TIME AND MATERIAL RECORDS.

Standard letter size vertical filing cabinet sections are partitioned into three divisions, at little expense, for the filing of Forms 8 and 9, using two colors of guides, one for the machine number and the other for the numbers of the parts belonging to the machine, which follow back of the machine number. It is divided into two divisions—Process of Construction and Completed Work. The time for the current month is held out of the file until entered on the summary and balanced with the pay-roll.

All reports of material and labor are filed by months in a vertical cabinet section equipped with guides for each account. In this way it is easy to verify and report in detail any expense item shown in the summary statement.

FILING REQUISITIONS.

Standard five by eight vertical filing cabinet sections are equipped with guides showing the number of each machine numerically, and Forms 3 and 4, reports of red tags (Form 2), and Form 6 are filed back of the guide for the respective machine. It is divided into two divisions, the same as the filing of the time, and the reports for the current month are held out until entered on the summary showing the distribution of the material.

SUMMARY OF PRODUCTIVE WORK AND FACTORY EXPENSE.

Form 12 is for summarizing monthly the time and wages put in on each lot of machines and each factory expense account and balancing with the pay-roll, and the material and supplies taken from stock for each lot of machines and for each factory expense account.

When a lot of any machine is completed, the total cost is entered in the total column on the right-hand margin and checked with the summary of the distribution, as shown on Form 13.

A transfer of uncompleted orders is necessary but once a year.

By using two lines for each machine number and expense account, there are shown the time, wages expense and material for each month, and the totals to the end of each month, which renders it unnecessary that the ledger accounts should show the summary of the monthly totals. There is allotted

to one number as many lines as needed for recording together all the lots of that machine built during one year. The expense accounts are entered in a separate division of the record. In this way, the machine numbers and expense accounts are classified and indexed with leather tabs at the end or side, thus giving a direct reference to any order and account.

The factory expense rate is fixed at the beginning of each month and used for all the time in that month. This rate is adjusted each month in accordance with the balance of the Factory Expense Adjustment account. This permits entering the balance of the time on this record as the work is finished and figured up for report on Form 13. In this manner the records can be entered complete as the jobs are finished and the cost reported.

SUMMARY OF PRODUCTIVE WORK and FACTORY EXPENSE

YEAR _____

	Order or Machine Number	JANUARY Hours Auto	JANUARY Hours Pay Roll	JANUARY Cost Wages	JANUARY Cost Factory Expense	JANUARY Cost Material	TOTAL Hours Auto	TOTAL Hours Pay Roll	TOTAL Cost Wages	TOTAL Cost Factory Expense	TOTAL Cost Material
1	No. Lot No.										
	Total to end of month										
2	Account										
	Total to end of month										
		2⅜		2⅜			2⅜				
	Total of month										
	Total to end of month										

Form 12

COMPARATIVE COST OF THE TWO LAST LOTS Mach No. _____

DIVISION OF WORK	Lot No. ____ COMPLETED Hours	Wages	Stock	Lot No. ____ COMPLETED Hours	Wages	Stock
Cleaning Castings						
Blacksmithing						
Lathe						
Grinding						
Drilling						
Milling						
Planing						
Polishing						
Tools						
Countershafts						
Assembling						
Total						
Stock						
Expense-@ @						
Cost of Lot						
Cost of One Machine						

FORM 13.

Lesson Eleven.

CLASSIFICATION OF FACTORY ACCOUNTS.

DEBITS.

FACTORY EXPENSE ACCOUNTS.

Departments
- Assembling
- Boxing and Crating
- Castings Cleaning
- Countershaft
- Drilling
- Gear Cutting
- Grinding
- Lathe
- Milling
- Pattern
- Planing
- Polishing
- Power, Light and Heating
- Shipping
- Smith Shop
- Store-room
- Tool-room

Maintenance
- Buildings
- Equipment Machinery
- Equipment Transportation
- Equipment Power, Light and Heating Plant

Supervision
- Production — Salaries; Maintenance of Office
- Works — Salaries; Maintenance of Office
- Engineering — Salaries; Maintenance of Office
- Purchasing — Salaries; Maintenance of Office
- Cost Dept. — Salaries; Maintenance of Office

Miscellaneous
- Insurance
- Taxes
- Depreciation

Manufacturing Product
- Labor
- Material
- Factory Expense

Finished Product

Product Shipped

CREDITS.

Manufacturing Product

Pay-roll

Store-room

Miscellaneous

Factory Expense Adjustment

Finished Product

To close the factory records, charge all the expense accounts into the Factory Expense Adjustment Account.

DEPARTMENT EXPENSE.

Once a week each department makes a requisition on the storeroom for supplies for the coming week which are placed in the care of the tool-man in

that department for distribution as needed. This method avoids a great many requisitions for small quantities and with proper handling will give accurate results and a saving of time in distributing the supplies.

Form 8 is used for recording all department expense time and is stamped in the clock by the workmen just the same as for productive work.

At the end of each month the cost of the supplies as shown by the requisitions and the cost of the time is charged to the departments by summarizing or Form 12 in the manner as previously explained.

MAINTENANCE EXPENSE.

The material used and the time put in maintaining the buildings and equipment is handled in the same manner as for the department expense, except that the material is taken from the storeroom as repairs are being made.

SUPERVISION EXPENSE.

Supervision includes the salaries of supervisors, their assistants and clerks, and the maintenance of the office and records necessary in carrying on the work.

The cost to purchase material and supplies, and expense of figuring cost and keeping up the general factory office and records are classed under this division.

MISCELLANEOUS EXPENSE.

Miscellaneous expense covers the general fixed charges brought about through the existence of the factory.

The department, maintenance, supervision and miscellaneous expense accounts contain all the expense of operating and keeping up the factory to manufacture the product. This entire expense is carried into the product through the Factory Expense Adjustment account, as previously explained.

All the material and supplies taken from stock is summarized on Form 12, and the total each month is credited to the Storeroom account.

Each month the total of the distribution of labor as shown on Form 12 is credited to the Pay Roll account.

The Miscellaneous Credit account is to offset the miscellaneous expenses and effect a balance of the factory accounts.

The pay roll and miscellaneous credits agree with the general book charges for the same accounts, and the storeroom credit furnishes the general bookkeeper the amount for credit to the General Storeroom account, and the balance shown by this account represents the value of the stock on hand.

As the product is completed a credit at cost is made to Manufacturing Product, and charged to Finished Product and, as product is sold a credit at cost is made to Finished Product and charged to Product Shipped. In this manner there is a perpetual inventory of the product under construction and product finished and on hand.

A small ledger is kept showing the summary of the following accounts:

Manufactured Product
Finished Product
Product Shipped
Pay-roll
Store-room
Miscellaneous
Factory Expense Adjustment

At the close of each month the factory bookkeeper who is the chief cost clerk, makes a complete report of the above classified accounts to the general bookkeeper for use in closing the general book accounts and forming a part of the general statement of the business.

(325) ACCOUNTING METHODS FOR THE MOTOR MANUFACTURING INDUSTRY.

As the work of building machines of any description originates from the drafting department, we will first take up the methods followed after drawings are completed.

Drawings are all numbered according to subdivision of machines. In a gasoline motor or engine it is a very easy matter to subdivide the reciprocating parts into a certain quantity of letters.

For instance, letter "A" would represent the cylinder division, which would also take in all parts used on the cylinders, such as pistons, piston rings, etc. Next in order would come letter "B," which would represent the crank case division, and would include all parts attached to, or forming a part of the crank case. In one factory the engine drawings are subdivided into twelve divisions as follows:

"A" Cylinder Division,
"B" Crank Case Division,
"C" Crank Shaft and Flywheel Division,
"D" Connecting Rod Division,
"E" Exhaust Fittings,
"F" Inlet Fittings,
"G" Bearings used throughout the engine,
"H" Gears,
"I" Valve and Cam Shaft Mechanism,
"K" Cooling Division,
"L" Oiling System,
"M" Ignition System.

These same subdivisions apply on all different types of engines; the type of engine being distinguished by prefixing a letter by which the model is designated. For instance, a new engine was designed and designated as type "G," all parts entering into the construction of this engine would have the letter "G" prefixed before the symbol number of the part, i. e. GA-100 would be the piston pin, GA-101 the piston plug, etc. Form 1 will explain the idea comprehensively.

Complete records of all drawings are kept and as soon as tracings are completed a card, Form 2, is written up and filed in its proper place in drafting department. As blue prints are made from drawings to be delivered to shop, they are recorded on Form 3, which is reverse side of Form 2, giving date and department to whom delivered. In this way the drafting department have

a complete record of all blue prints in the shop, which is oftentimes a very important matter.

Parts now all being properly named and numbered, the next step is to have patterns made. Before pattern makers can start work, they are furnished with blue prints and an order properly written and O. K'd, as per Form 4. Pattern being completed, it is ready for the purchasing department, who have by this time already made negotiations with foundry for delivery of castings, etc. The order is now placed for the quantity required, on purchase order, Form 5, which is made up in triplicate; original for the vendor, duplicate for following up deliveries, and keeping records of receipts, triplicate copy for the store-keeper.

MODEL "G" MOTOR

Parts used on all styles Model "G"

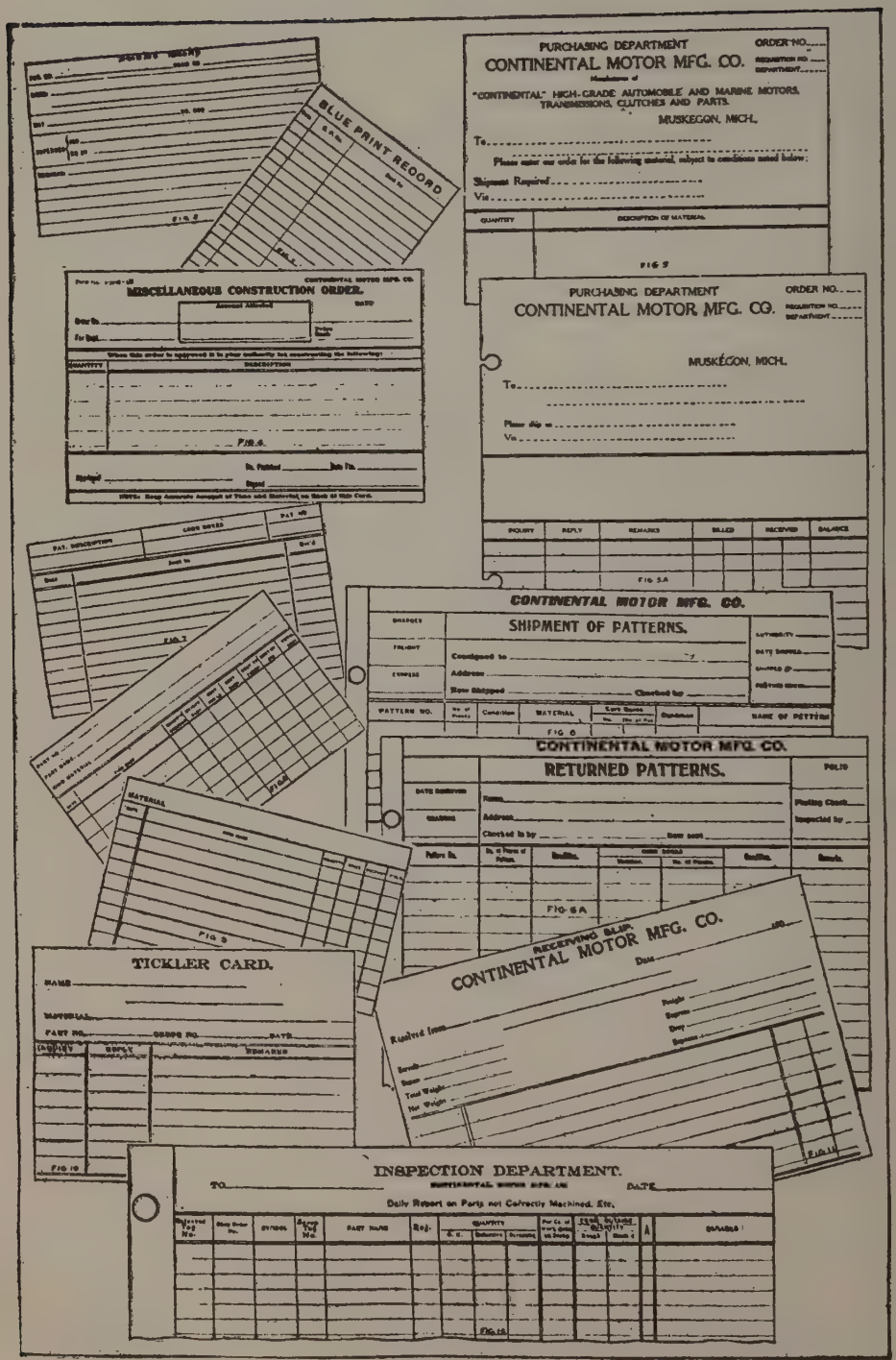
Symbol	Name	No. Req.	Mat.
GA 100	Piston pin	4	St. tube
GA 101	Cylinder plug	4	brass
GA 102	Cylinder plug stud	4	steel
GA 103	Cylinder Stud	12	"
GA 104	Cylinder plug stud nut	4	"
GA 105	Cylinder relief cock	4	brass
GA 107	Port hole gasket	8	mobiline
GA 200	Inlet valve plug	4	brass
GA 201	Exhaust valve plug	4	"
GA 202	Piston ring	18	C. I.
GA 203	Cylinder gasket	2	paper
GA 204	Cylinder cover gasket	2	"
GA 300	Cylinder cover	2	C. I.
GA 301	Piston	4	"
GA 600	Cylinder	2	C. I.
GB 104	Gear case bolt	6	steel
GB 105	Oil pan plug	5	brass
GB 106	Crank case bolt	21	steel
GB 107	Crank case bolt nut	21	"
GB 108	Bearing bolt	12	"
GB 109	Bearing bolt nut	26	"
GB 110	Bearing bolt lock nut	12	"
GB 111	Breather pipe flange	1	brass
GB 113	Crank case cap screw	3	steel
GB 114	Gear case screw	3	"
GB 115	Breather pipe	1	Copper tube
GB 116	Breather pipe plug	1	harawood

Before shipping the patterns they are carefully checked by the engineering department and if satisfactory in their estimation, are O. K'd for shipment. Pattern shipping order, Form 6, is written up and any comments regarding conditions of patterns, number of core boxes, etc., being noted thereon. A complete record of patterns is kept in the purchasing department. Separate card, Form 7, being used for each pattern. After shipment the pattern shipping order, Form 6, is placed in binder and pattern is now charged to vendor on Form 7. It does not require much thought to see the importance of keeping a careful and accurate record of patterns, especially in a business where possibly several thousand patterns are used from time to time, whether stored in pattern vaults or shipped to various parts of the country.

A record of quotations is kept by purchase department on Form 8. This record consists of quotations made by different concerns and forms a record for looking up prices or ascertaining the raw cost of different parts. A special record is also kept for quotations on supplies, as per Form 9. Just as soon as quotations are made, the prices are entered on these cards. There is little or no trouble whatever in ascertaining the cost of any part with this method, but without the card record it would be necessary to look through bunches of correspondence and waste hours of valuable time in securing this needed information.

Referring again to copy of the purchase order, Forms 5-a and 5-b, have been reposing in the binder and delivery dates having been specified, a tickler card, Form 10, is made up and carefully filed ahead so as to mature a few days before shipment is promised; the tickler card being filed ahead from time to time as the shipments are promised. This method pursued until all parts on the order have been delivered. Upon receipt of invoice the copy of purchase order, Form 5-b, is referred to and notations made giving date and quantity billed. It will also be noted that provision is made on purchase order for recording actual deliveries made.

Complete stock lists are made covering each individual engine, as per Form 1. The receiving clerk being supplied with a complete list for each motor and with this information in hand, it is not necessary for him to have a copy of the purchase order. No advice is given him as to the quantity of parts coming in, he being required to make an independent report on the quantities received. This information is recorded on receiving slips, Form 11, which are written in triplicate; original is sent to purchase department, thus checking up the quantities billed, duplicate to inspection department with materials, and triplicate is retained by the receiving clerk as his record for future reference. All parts received, either rough or finished, are subjected to a rigid test, and such parts as are not up to specifications are culled and held subject to the instructions of purchase department, who usually hold these items over until an economical shipment can be made, when they are sent back to the manufacturer. All parts rejected are reported on inspection department report, Form 12. The further use of this report will be explained further on.


BLUE PRINT RECORD
PURCHASING DEPARTMENT
CONTINENTAL MOTOR MFG. CO.
ORDER NO.
"CONTINENTAL" HIGH-GRADE AUTOMOBILE AND MARINE MOTORS, TRANSMISSIONS, CLUTCHES AND PARTS.
MUSKEGON, MICH.
To
Please enter our order for the following material, subject to conditions noted below:
Shipment Required
Via
QUANTITY
DESCRIPTION OF MATERIAL
FIG 9
MISCELLANEOUS CONSTRUCTION ORDER.
QUANTITY
DESCRIPTION
FIG 8
PURCHASING DEPARTMENT
CONTINENTAL MOTOR MFG. CO.
ORDER NO.
MUSKEGON, MICH.
To
Please ship to
Via
INQUIRY
REPLY
REMARKS
BILLED
RECEIVED
BALANCE
FIG 9A
CONTINENTAL MOTOR MFG. CO.
SHIPMENT OF PATTERNS.
Consigned to
Address
Now Shipped
Checked by
PATTERN NO.
Condition
MATERIAL
Cast Brass
Steel
NAME OF PATTERN
FIG 6
CONTINENTAL MOTOR MFG. CO.
RETURNED PATTERNS.
Name
Address
Checked in by
Pattern No.
No. of Pieces of Pattern
Condition
Condition
Remarks
FIG 6A
MATERIAL
FIG 5
TICKLER CARD.
NAME
MATERIAL
PART NO.
ORDER NO.
DATE
INQUIRY
REPLY
REMARKS
FIG 10
RECEIVING SLIP
CONTINENTAL MOTOR MFG. CO.
Date
Received from
Boxes
Tare Weight
Net Weight
FIG 11
INSPECTION DEPARTMENT.
TO
DATE
Daily Report on Parts not Correctly Machined, Etc.
Inspector's Tag No.
Shop Order No.
Symbol
Assembly Tag No.
PART NAME
Req.
QUANTITY
O. K.
Defective
Scrapped
Per Ct. of Prod. on Daily Report
ITEM SCRAPPED QUANTITY
Week
Month
A
REMARKS
FIG 12

Lesson Eleven.

STORES CONTROL.

Stores control is of such paramount importance that too much cannot be written on this subject. The continuous process factory offers excellent opportunities for maintaining accurate records of quantities received and disbursed. It has been found that whenever the system of stores control was lax, serious mistakes were made in purchasing, and the shop foremen readily found a way to replace parts spoiled in machining, the spoiled items being assisted in taking "French leave" from the factory. The general tendency of workmen is to withhold information of this description from the office whenever possible, making it a most difficult matter to obtain accurate costs.

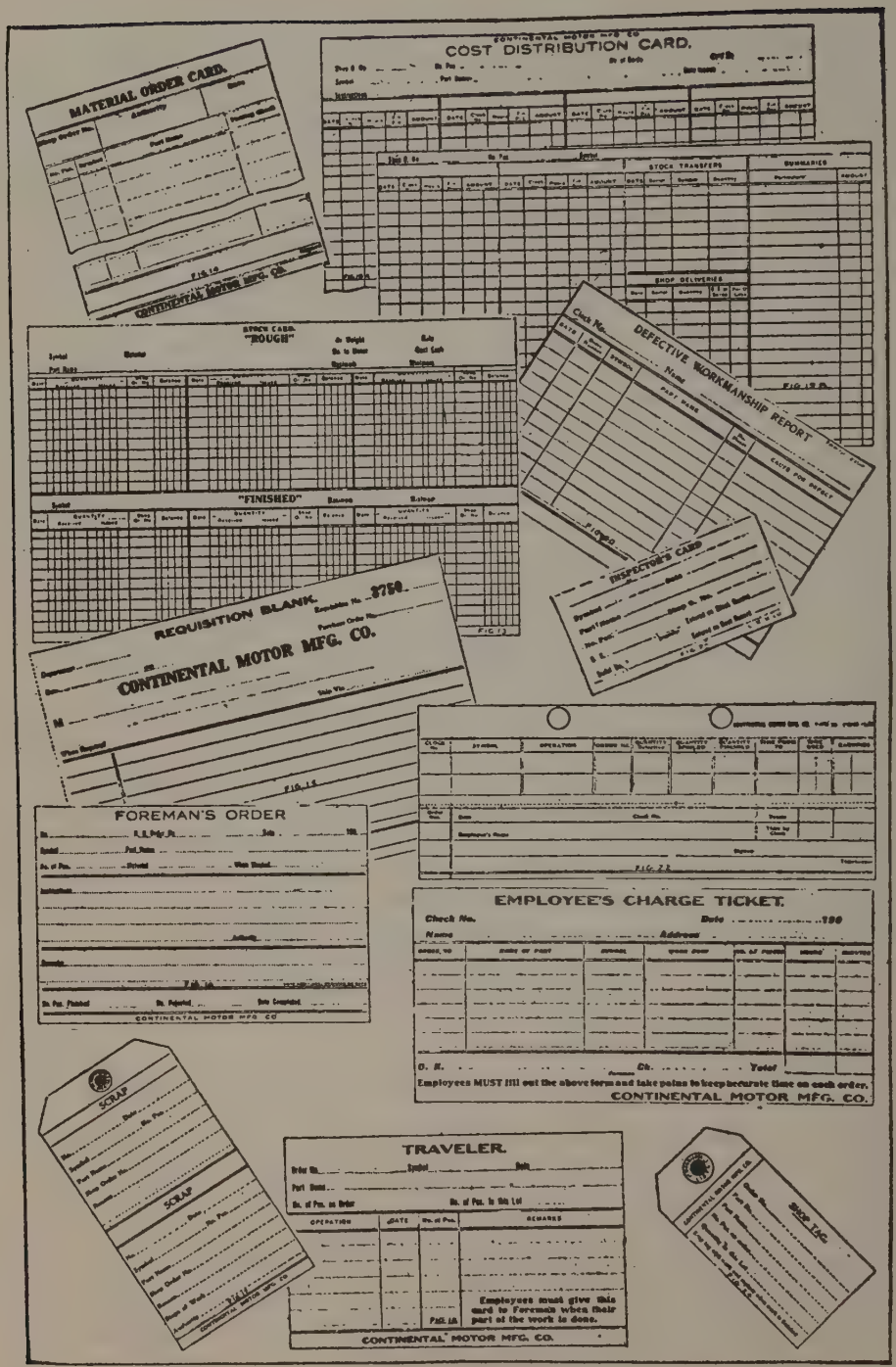
The stock records are kept in the purchase department. Receipts of stock are posted from receiving slips to stock card, Form 13. Records of disbursements of stock are made from material order cards, Form 14, which must be properly O. K.'d and shop order noted thereon before store-keeper will deliver materials. Stock is only delivered to material rushing department, which is the only authorized department to whom the store-keeper can transfer stock. After deductions are made from stock records, Form 13, material order cards are forwarded to cost department for their records.

In the method of construction of Form 13, will be noted that provision is made for both raw and finished stock on the same card. This serves a two-fold purpose. First, stock movements on any shop order can be followed independently by purchase department, without interfering with cost records or referring back and forth on stock cards, as would be necessary with two sets of cards. Second, less labor is required to make postings, as there is only one set of cards to look after.

Stock ledger keeper is responsible for carrying the required amount of stock. Lists of limits are given him, requiring him to maintain a certain amount of stock at all times until instructed otherwise. When the amount of stock on hand begins to reach the minimum he makes out a requisition, Form 15, providing, however, that there is not a standing order on the parts reported below the minimum. Supplies of all kinds, small tools, etc., are ordered by superintendent on these requisitions, department in which same is to be used will be noted thereon.

SHOP ORDERS.

Allowing that the major portions entering into the construction of the machine are at hand, the next step is to issue shop orders for machine and assembly work. Complete stock lists of all types of machines manufactured in the plant are a part of the cost department's records. With this array of information in hand, orders will be issued intelligently. Separate shop orders, Form 16, are written for the quantities desired covering each component part on the engine, and in such quantities only as will permit the cost being ascertained at certain intervals. For instance, the total quantity necessary on a contract of a certain component part to be eight hundred pieces. The shop


MATERIAL ORDER CARD.
CONTINENTAL MOTOR MFG. CO.
COST DISTRIBUTION CARD.
STOCK TRANSFERS
SUNDRIES
SHOP DELIVERIES
STOCK CARD.
"ROUGH"
"FINISHED"
DEFECTIVE WORKMANSHIP REPORT
INSPECTOR'S CARD
REQUISITION BLANK.
CONTINENTAL MOTOR MFG. CO.
FOREMAN'S ORDER
CONTINENTAL MOTOR MFG. CO.
EMPLOYEE'S CHARGE TICKET.
Employees MUST fill out the above form and take pains to keep accurate time on each order.
CONTINENTAL MOTOR MFG. CO.
SCRAP
SCRAP
TRAVELER.
Employees must give this card to Foreman when their part of the work is done.
CONTINENTAL MOTOR MFG. CO.
SHOP TAG.

order would probably be issued for about two hundred at a time. This method enables making comparisons—a factor so important for the reduction of cost. It also aids in detecting any abnormal increase in cost before it is too late, as should the order be issued for the entire amount, the cost could not be figured until entire job was closed.

One weakness manifest in most cost systems is that shop orders are issued in such quantities that serious losses on scrap and defective workmanship are not detected until the entire order is closed. This system promptly and efficiently detects all irregularities, as parts are inspected at certain intervals and before any further machine work can be done on them they are oftentimes required to caliper to dimensions calculated by the thousandth part of an inch. Such work as does not come within the limits allowed is promptly scrapped. It is here where heavy losses are prevented inasmuch as additional work is stopped on parts which proved defective, possibly before ten per cent. of the work was done.

When parts are scrapped, they are reported to cost department on scrap tags, Form 17, which will state percentage of work done on scrap, shop order number, and causes for defects. Shop orders, Form 16, are issued in triplicate; original or foreman's order, to material rusher, who makes a copy of the order for his records and delivers it to foreman in department affected, duplicate is sent to store-keeper which is his authority to issue parts as stated on the order, and triplicate is filed in cost department for their records. This triplicate copy being used for following up the order from time to time. A register of all shop orders issued is also kept in cost department for ready reference.

Work is assigned to various employes by the foreman who furnishes blue prints for the work in hand. The material rusher has the stock trucked to workman's machine—together with traveler, Form 18, stating quantity on the order, etc. A small tin box is attached to each machine, large enough to accommodate travelers, time cards, etc., in this way providing one place for all records in connection with the shop orders to which the workman is obliged to refer. The material rusher has access to these boxes and when any parts are taken from the machine, this information is noted on the traveler.

Parts in process of machining, as already stated—are trucked to inspection department between certain specified operations for test, and any proving defective are rejected, being reported on scrap tag, Form 17. This tag is made up in duplicate and tag end is attached to spoiled parts. A summary of the information on these tags is made on inspection department report, Form 12. First copy is sent to superintendent, second to purchase department, and third to cost department which puts this information in permanent form. These records are carefully filed away in binders in the order of date, after proper attention has been given the matter in hand. The items scrapped are then priced and the total amounts of all reports for the month are posted to scrap account in the general ledger. Card ends of scrap tags are first sent to stock ledger keeper who deducts quantity scrapped from his records and then forwards tags to cost department.

They now serve as delivery slips on shop orders on which the parts were scrapped. When the shop order is written a cost distribution card, Form 19-a, (and Form 19-b, which is reverse side of Form 19-a), is also written and filed in rotation in accordance with shop order number.

Everything is now in readiness for recording labor, stock transfers and shop deliveries. The stock transfers are posted from material order cards, Form 14. The method being to charge all material transferred from stock to the shop order distribution card on which it was issued. A complete accounting must be made for each part issued from stock—this being one reason why parts scrapped must be reported.

A demerit system covering defective work is operated in connection with inspection and material rushing departments. When parts are spoiled in machining, the individual at fault is censured and a careful record is kept of all parts he spoiled on defective workmanship report, Form 20, cards being made up for all workmen turning out defective work. This record is carefully kept up from time to time and serves as a basis for determining whether or not the workman is efficient and is referred to when employe requests an advance in salary. If his record is clear, he stands in line for promotion.

Granting that the materials have reached their final stage of machining they are trucked to inspection department and after they pass final inspection the parts are quickly sent to finished stock room, together with inspector's card, Form 21, this card stating quantity in the lots and bearing proper O. K. of inspector. After stock-keeper has satisfied himself that count is correct, the tags are forwarded to stock ledger keeper, who makes his postings under (caption) finished stock. The card is then sent to cost department, and entry is made to cost distribution card, Form 19-b, under (caption) shop deliveries. Thus, will be seen that all parts issued on the order are accounted for.

TIME SPENT ON ORDERS.

Time spent on the various shop orders is gathered by factory clerks directly from the men on Form 22. Each employe is also provided with an employe's charge ticket, Form 23, so he can jot down the time spent as he completes his work on the various orders. There are several methods used to enable workmen to charge time spent to correct orders. First, a traveler, Form 18, is furnished him by material rushing department. This form stating the number of parts on the order, giving symbol and part name. Second, when the parts are large enough to number, they are numbered in accordance with shop order number; to articles which cannot be numbered, a linen tag is attached, Form 24. This numbering and tagging is necessary on account of the numerous quantities going through the shop at one time. Oftentimes, two or three batches of the same parts are in process of machining at the same time. Thus the importance of tagging and numbering can be appreciated. The duty of numbering parts is imposed on the material rusher.

Standard automatic time registers are used to record the arrival and departure of employes, separate card being issued for each man. This method

making each employe his own time-keeper. Daily the time-keeper sends to cost department a list of employes who are absent or late in accordance with reports of clock time cards. Four trips are made daily by the factory clerks gathering time from employes on Form 22. It will be noted that this form is composed of perforated coupons. Four are used to record time spent on different operations or jobs. Bottom coupon is for recapitulation and is filed according to clock number of man. The time-keeper's reports are compared with the time gathered on Form 22, and after the costs are extended and footed, coupons are torn off at perforations and filed in cost envelopes. These cost envelopes are filed in numerical order in accordance with shop order number. When an order is reported closed, the coupon slips are all arranged in order of operation and posted. After adding factory and general expense to labor, then including material, the cost per unit is calculated.

The average labor cost of all orders is transferred to cost cards, Form 26, which card is a summary of all orders issued for a particular part. It is here that fluctuations of costs are discovered. Report of increased cost of parts, Form 27, is handed to superintendent on any order on which the cost is in excess of lowest cost on record for that part. This report is issued in duplicate. Original is retained for his records and duplicate with reply is returned to cost department. Superintendent is required to report why the cost of parts has increased. Costs are sometimes increased on account of shortage of material in the shop. This, however, happens very seldom, but in order to have a record in concrete form before the purchase department of all parts which are absolutely necessary to get in the shop in order that the cost of production is not increased, a rush list, Form 28, has been devised. All items listed on this form receive special attention and the frequency of letters written to vendors pounding them for deliveries, urges upon them the importance of making prompt shipments.

In assembly department, stock completely machined, as already stated, is carried in finished store room ready for assembling purposes. Finished parts are only transferred from storeroom to workmen on presentation of proper form, assemblers' instructions, Form 29, which is made out from shop order for foreman. The assembly department is divided as follows:

Chipping and Filing Department,
Cylinder Assembly Department,
Bearing Scraping Department,
Miscellaneous Assembly Department,
General Assembly Department.

Each department is required to handle a certain portion of the engine. For instance, a form is devised covering all parts used by the cylinder assembly department for the assembly, and a different form for each of the other departments. When any departments require material, they present their order calling for a specified amount to store-keeper, who furnishes material in accordance with same, and if there are any shortages in the stockroom, the man is furnished with a shortage blank, Form 30, which is his

authority to secure further material from storeroom. A copy of this slip is filed by store-keeper and as soon as the parts come in from the machine shop they are sent to workman. The same routine being carried out in entire assembly department.

Sometimes the assembly of engines is badly delayed on account of shortage of some items. In this case, the assembly foreman makes up an emergency shortage slip, Form 31. This list is only to be used in case of extreme necessity and is forwarded to machine shop foreman, who takes necessary steps to get this material into assembly department with all dispatch.

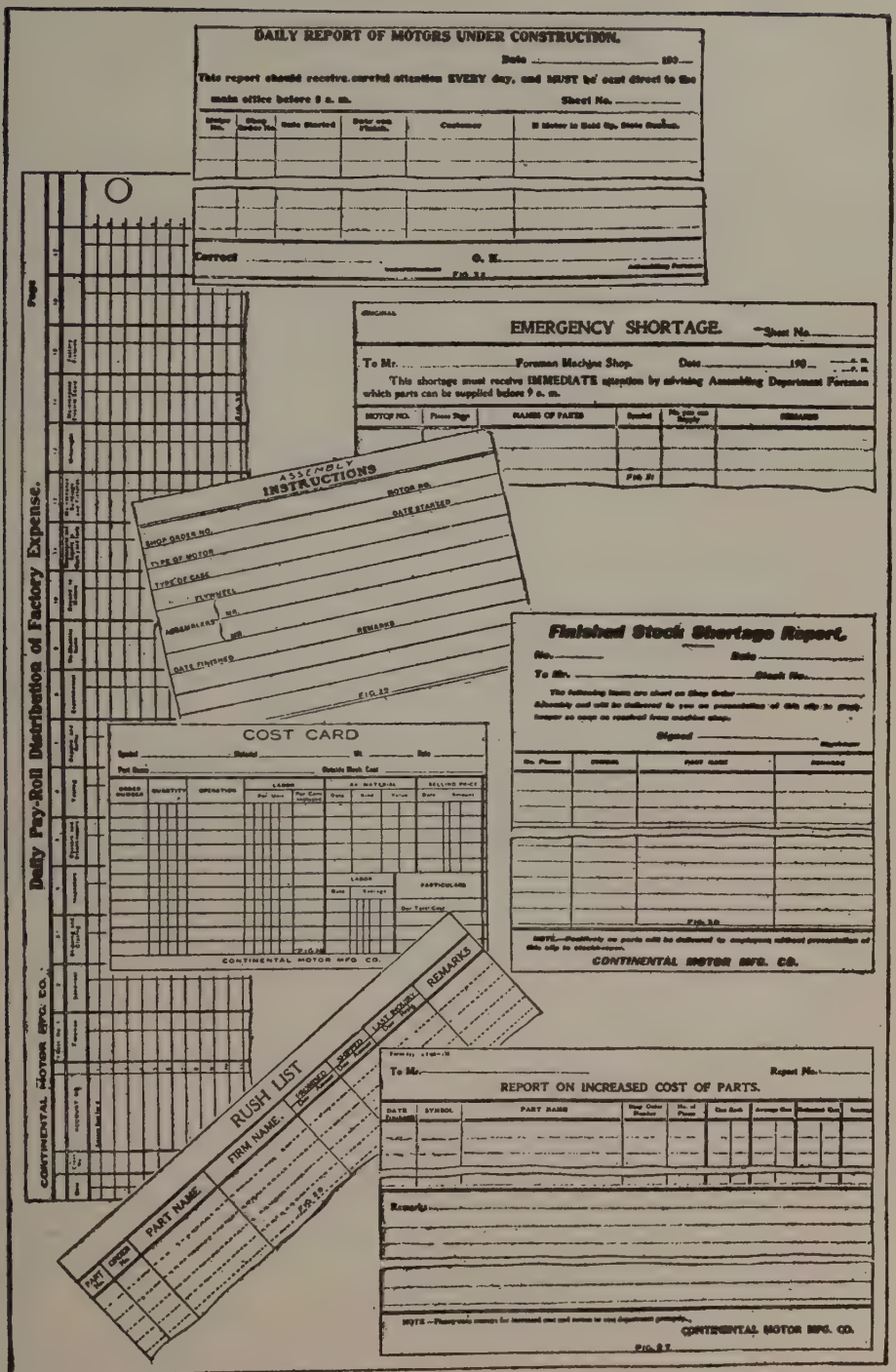
Daily a report of motors under construction is sent to office on Form 32. This report keeps the office in constant advice as to the progress of motors on the floor. In this way the office can intelligently correspond with its customers stating just what deliveries of finished machines can be made. Then, again, in case there is any prolonged delay in getting out certain motors the matter can be looked into by the office and steps taken to remedy cause of delay, which might be due to a number of causes which would, without this form of report, not be brought to the attention of the office.

OPERATING EXPENSES.

The up-to-date cost accountant and manufacturer knows that a percentage of operating, commonly called "overhead," must be added to prime cost sufficient to cancel all factory and office expenses, incurred in connection with the product. Extraordinary expenses, however, do not form a part of operating expenses. Operating expenses form an important factor in cost and it is a comparatively simple matter to allow the proper percentage of overhead, providing the trading and commercial expenses for the previous period were properly kept. Overhead is pro-rated on productive labor only. In order to get a basis for computing overhead expense, it is only necessary to take in sum-total all factory expenses incurred during the last fiscal period, ascertain what percentage these expenditures bear to the total amount of productive labor for the period. The same method is pursued for obtaining overhead to be pro-rated for commercial expense.

If, however, the trading and commercial expenses have not been kept accurately, the following method can be used. Take sum-total of all factory expenses, plus the sum-total of all current office expenses for a month, or if possible, a certain number of months, ascertain what percentage this amount bears to productive labor spent within that period. Care must be taken to make allowance for taxes and fixed expense which might come in under that period. To make the matter more clear, we will assume the total factory expenses for the previous year were $60,000, and commercial expenses were $48,000; say productive labor was $120,000. After a little calculation, it will be seen that total expenditures equal 90 per cent. of productive labor. The allowance for overhead would then be as follows:

50 per cent. for factory expenses.
40 per cent. for commercial expenses.


DAILY REPORT OF MOTORS UNDER CONSTRUCTION.
EMERGENCY SHORTAGE.
ASSEMBLY INSTRUCTIONS
COST CARD
CONTINENTAL MOTOR MFG. CO.
Finished Stock Shortage Report.
CONTINENTAL MOTOR MFG. CO.
RUSH LIST
REPORT ON INCREASED COST OF PARTS.
CONTINENTAL MOTOR MFG. CO.
Daily Pay-Roll Distribution of Factory Expense.

Thus, in computing the cost on an article, we would say,—

Labor expended	$27.00
Add factory expenses (50 per cent.)	13.50
Add general expense (40 per cent.)	10.80
Add material cost	10.00
Total cost	$61.30

Operating expenses are pro-rated on productive labor; first, because cost of materials fluctuate more than cost of labor; second, if pro-rated on the material the amounts to be allowed would oftentimes be most extraordinary. Take, for instance, in a very large casting. Material would be very expensive while little labor might be required. Then, again, the material cost might be trifling when the labor cost would be enormous. The part which required a small outlay for material would receive a correspondingly small percentage of overhead when in reality a great deal of superintendence and expensive equipment would be required to properly machine the part. Thus, labor is the most flexible of the two as it graduates in accordance with rate paid the workman and number of hours worked.

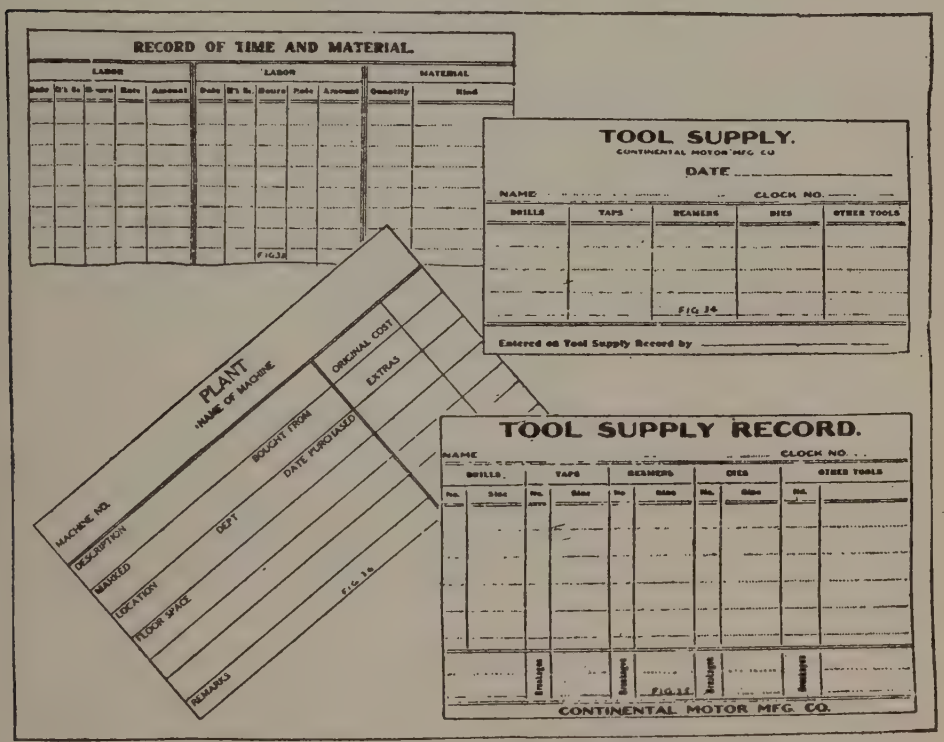
Extremes are taken care of in both instances. Skilled and unskilled labor, whether bench or machine hands, are burdened with an overhead in ratio to their earnings, and the time spent. There are several distinct advantages in using the percentage method. First, costs can be ascertained immediately upon completion of the order. Second, time spent can be divided according to department and overhead calculated for that department as departments should bear their own ratio of expense. Third, the simplicity by which costs can be computed in using the percentage method makes it preferable to the machine-hour and man-hour plans. There are, however, some lines of business in which it would be impracticable to use the percentage method, but on the whole, for a continuous process factory, the percentage method is practical and convenient.

In order to obtain a satisfactory distribution of factory expenses incurred through labor, Form 37 has been devised. This distribution record is closed twice a month with the pay-roll and totals of each amount transferred to a comparative record. By compiling and comparing the accounts in this way abnormal increases are quickly noted. If the increase is out of proportion to production, investigations are made.

A large tool department is kept busy the year round constructing special tools and jigs for the rapid production of duplicate parts. A careful record is kept of all special tools and jigs built. No tool or fixture of any description can be built unless an order, Form 4, properly authorized, is issued. All time and material used on these orders is charged up against this order and record made on Form 33, which is reverse side of Form 4. Upon completion of the jig, tool or fixture, the order number on which the part was constructed is stamped on the part for future identification. This facilitates taking inventory and charging off proper depreciation on the different tools. These

miscellaneous construction orders are all filed according to either part number or tool order number and form a complete record until the tool is made obsolete.

All patterns, tools, jigs and fixtures constructed to facilitate production are charged to special accounts in the general ledger, an account being opened with each class of tools, etc. For instance, the firm were building six distinct types of motors. There would be six special accounts covering patterns, tools and fixtures and these accounts would not only be subject to depreciation due to wear and tear, but they would be gradually written off in the same ratio as the particular type of machine became obsolete. In this way these accounts would not become misleading as would be the case were they all carried in a general tools account.



A special effort should be made to keep a thorough check on tools—both large and small. When a man is employed, he is, to a more or less degree, obliged to use tools belonging to the firm. When a tool of any description is delivered to him, he is required to fill out tool slip, Form 34, this slip stating the tool delivered to him and is placed on a spindle ready for posting to tool record, Form 35. In the toolroom there is a large board holding brass checks in numerical order and when the tool-keeper delivers the tool to a man, he not only has his record on Form 34, but also places a brass check

bearing the man's number in the place where the tool was removed. Men are not required to carry checks as is the system in vogue in most shops. Postings are made from tool slips every night to tool record, Form 35. In case a man returns the tool before the close of the day, tool slip which he has signed is destroyed and the only tools appearing on tool record are ones he has kept for a period of more than two days.

The small tools account on the general ledger is often a very misleading account, on account of the wear and tear and depreciation on these tools. To make the tools account show correctly, the tool-keeper is required to make up a report stating the quantity of tools broken and worn out. This list is then priced and the depreciation is charged to a special account called "scrap tools," and tools account is credited. In this way tools account always shows the true value of tools on hand.

A careful record is kept of all machinery, aside from the machinery account. All tools coming under the heading of machinery, such as lathes, drill presses, milling machines and special automatic machines are all numbered, a card, Form 36 (and 36-a, which is reverse side of 36), being made up for each machine. This card forming a record of initial cost, cost of setting up, any repairs and attachments, also location, and is filed according to type of machine. For instance, milling machines would be filed under subdivision guide card, Milling Machines. Drill presses under caption Drill Presses, etc. This forms a record not only accessible, but important for a multiplicity of reasons—especially in case of fire, as the location of each machine can be noted from these cards.

(326) BY-PRODUCTS.

The transformation of what used to be known as "Waste" into what is now termed "By-Products" has developed remarkably in the last few years. There appears to be value in everything that until recently was considered worthless and a new accounting problem has, therefore, arisen, viz.—the proper treatment of by-products and the productive labor and expense connected with same.

Take the meat-packing business as an example. We find neatsfoot stock to be transferred into glue; blood to be used for fertilizing; liver sweetbreads used as part of a pharmaceutical formula for pepsin; bones used for crude extract; small bones for tallow; kidney fat for oleomargarine.

The pepsin department includes the following preparations:—

Oil of Curacao
Alum
Sugar of Milk
Muriatic Acid
Sulphuric Acid
Phosphoric Acid
Citric Acid
Gasoline
Alcohol, P. S.
3 Vellum Parchment Paper

Soda Ash
22 in. Duck, No.
Saccharine
Syrup
Caromel, 12 lbs. to gal.
Glycerin
Gran. Rennets
Wood Alcohol
Gum Shellac
Saltpetre
Wohlin Powder
Benzoate Soda
Salicylic Acid
Borax
Granulated Sugar
Sausage Dip

Another interesting example of by-products is the manufacture of Sulphate of Iron. The acid that is used in pickling tubes before the cold drawing operation has always been a waste, being turned into the sewer. This acid after it has served its purpose in the pickling room is turned into steel vats and left the required time to crystallize. The tubes are then drained and the sulphate is barreled and shipped as any other product. This account is carried under a department of its own. There is no charge made to the department for the acid as it comes from the pickling room. The labor and material in repairs, also barrels for preparing same for shipment, are the only expenses connected with this department. The net profits are credited back to the pickling room where the acid which produces this has originally been charged. In this way the by-product from this factory or this particular department is a credit to that department. Thus department figures are used in the expense of manufacturing tubes and having credited them with this as a product of their department their general expense is shown by pay-roll distribution. In this way the earnings of the by-product are distributed to cover the general expense of manufacturing tubes.

(327) RETAIL STORES.

The departmentalization of retail stores has not yet developed to any great extent, but it would be found of value to any retail merchant to adopt some simple method of record, so that he may be able at any time to tell on what he is making and on what losing money. The grocer, the hardware merchant, the druggist, the gents' furnishing merchant, all have various departments. They purchase to the best of their ability, they sell all they can, and when they find they have over-purchased they dispose of shopworn goods at a sacrifice, but they do not know whether they have made a profit or a loss on their transactions.

Some of the following suggestions in connection with a book-keeping system for retail stores may be found of value.

(328) DRUG BUSINESS.

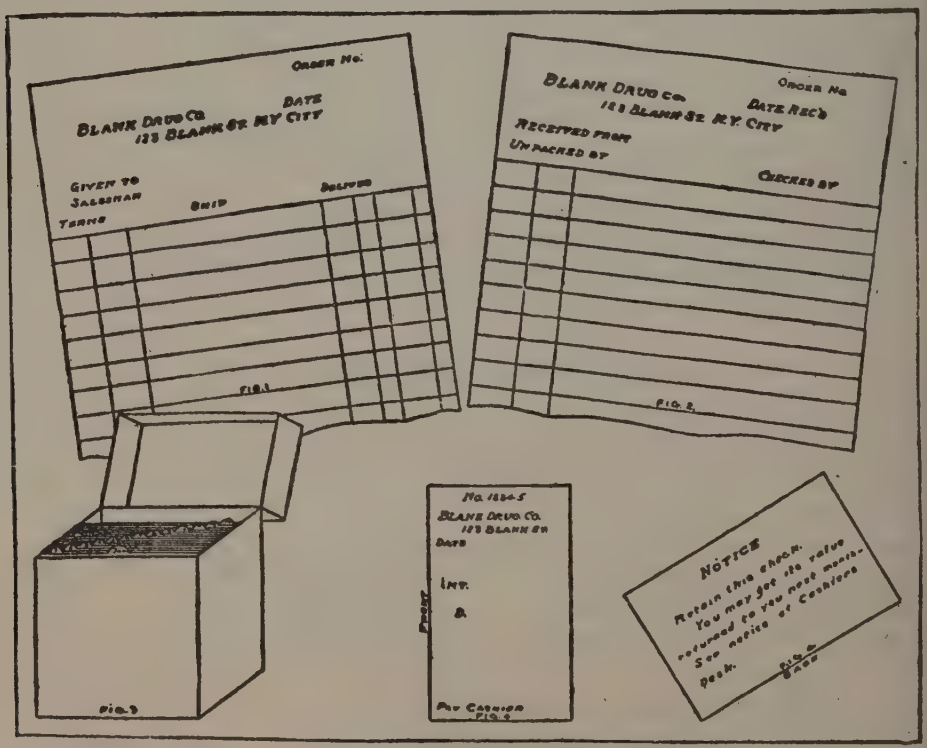
In a drug store we will name five departments as follows:—

Drugs
Soda
Patent Medicines
Toilet Articles
Sundries

In this business, as in any other, it is very desirable to issue purchase orders in triplicate. The original copy goes to the party from whom the goods are purchased, the duplicate is retained in the office, and the triplicate made with a short carbon so that quantities are not shown, is given to the receiving clerk. When the goods are received, the receiving clerk writes down on his triplicate purchase order the contents of every case of goods received and turns this list over to the buyer to be checked with the office copy of the purchase order.

After being checked, the goods are marked for sale, most drug stores following the plan of putting on cost price and selling price.

After the bill has been found to be correct, it is filed under date of maturity in a cabinet illustrated in Form 3. It has guide cards with the name of the month, and after each month follows the numbers from one to thirty or one to thirty-one.



All up-to-date drug stores have cash registers, and the keys of the cash register provide for the record of sales in any one or more of the five departments, so that at the end of each day the exact amount of sales for each separate department may be accurately ascertained.

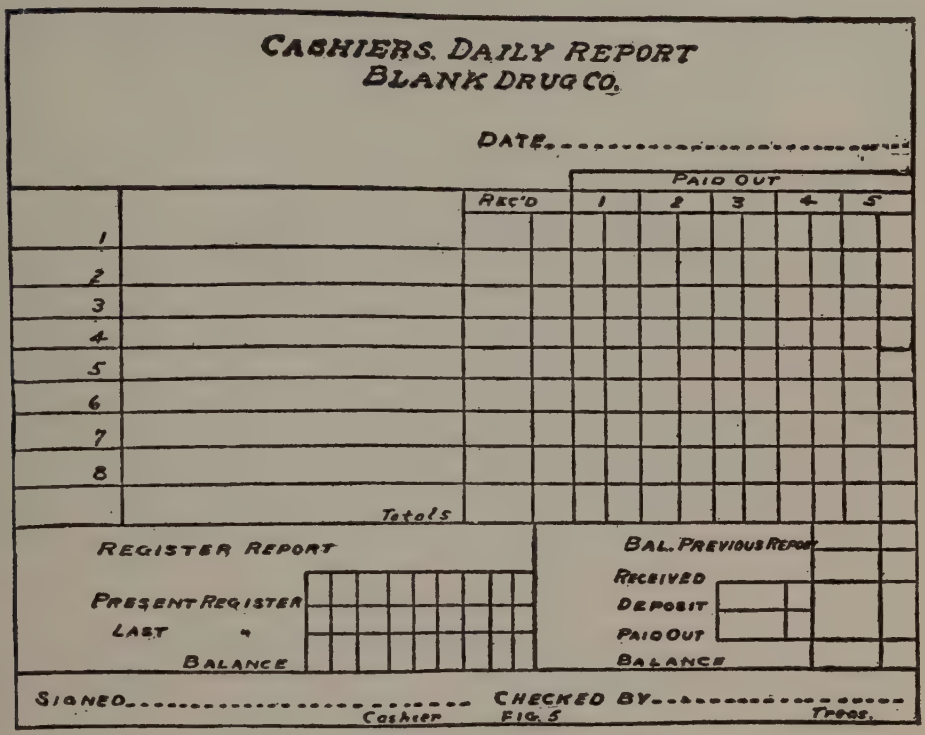


FIG. 5

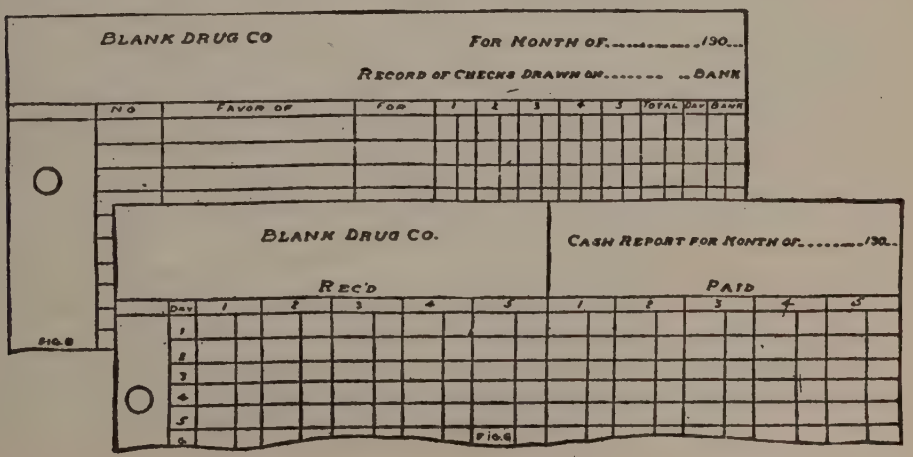


FIG. 6

At the end of each day the cash register tickets are listed by the cashier under the proper headings and the totals credited to the different departments.

At the end of each day the cashier makes out a report (see Form 5), showing the receipts for each separate department, and also all small payments made on account of each department.

Credit sales are made out on charge tickets. These charge tickets (see

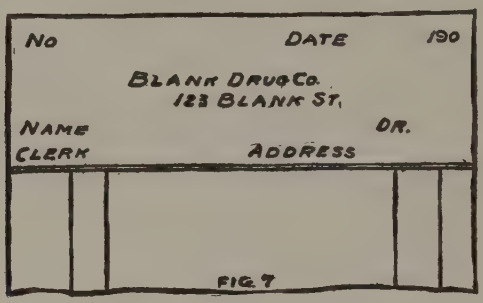


FIG. 7

Form 7), are collected and filed alphabetically and no other record of them is made. They are simply filed in a cabinet under the customer's name. When the bill is paid, it is put through the books as a cash sale. There may be some objection to this method, but in ordinary drug stores it is found entirely satisfactory and saves a great deal of unnecessary book-keeping work.

(329) CIGARS, MAGAZINES, ETC.

Let us take up the problem of a business dealing in magazines, newspapers, stationery, books and cigars; a main store with two branch stores in different parts of the city, the latter dealing only in cigars, magazines and newspapers; two hotel stands dealing only in cigars. The business at the branches and hotel stands is strictly cash. The business at the main store is both cash and credit.

The proprietor of the business applies to an accountant to devise for him a simple system of accounting records which will inform him at any time desired the results of the branch and hotel stands transactions, and also how much he makes on each particular department. He is not much acquainted with book-keeping and, therefore, desires a lucid explanation, sketches of forms recommended and information as to why they are expected to give satisfaction in use.

FIRST ANSWER.

It is required to know the results of the business done at each store as well as at the cigar stands. It is, therefore, necessary to keep an account with each store and cigar stand, these accounts to be arranged in the simplest possible manner, and to furnish statistics that will at all times be entirely clear,

and keep you posted on any variations that may arise so that the causes of such variations may be immediately investigated.

With regard to the two stores in which the business covers the sale of cigars, newspapers and magazines, etc., as this constitutes two separate departments, it might be possible to use separate cash registers for each department, but if this is considered inconvenient, another plan would be to use different colored cash tickets, making a recapitulation of same at the end of each day, the totals to be agreed with the amount reported by the cash register.

The question of accounting for cigars sold is quite difficult on account of the general practice of donating cigars and using them in other ways without value received; also the fact that single cigars are sold (for example) at 10c straight, while 3 sell for 25 cents, and considerably complicates the question of obtaining an accurate record. It is, however, entirely practical to keep a record showing total sales of the day, dividing the cigars into classes, such as nickel goods, ten-cent goods, etc.

It would, of course, be possible to keep a record of every sale of each brand of cigars, but to do this would require more clerical labor than would be justified by the results. This would be a case in which the system would defeat its own purpose.

We present herewith a plan for keeping a record of the general or reserve stock which is used by a leading tobacconist in one of our principal cities. He keeps a strict record of all cigars taken from the storeroom, and this includes not only the goods that are sold by the box, but all goods taken out and placed in the cases for retail sale. For the record of cigars carried in

High 10 M Low 5 M.

BRAND Goto KIND Havanna SIZE Perfecto 50's

BUY FROM Best and Russell Chicago. COST

Received			Taken From Stock												
Date		Quan.	Date		Quan.	Bal.	Date		Quan	Bal	Date		Quan.	Bal.	
10	1	10000	10	1	100	9900									
			10	5	50	9850									
			10	6	200	9650									
			10	9	150	9500									

FORM 1.

stock, there is used a form like the one shown in the illustration. This form is printed on a sheet 5 x 8 inches in size—the sheets being filed in a loose-leaf binder. The index is alphabetical, that is, the sheets are filed according to brand or name.

The record, however, is divided into classes, such as nickel goods, foreign, domestic and Key West. At the top of the sheet the form is printed to show the brand, kind, size, name of firm from whom bought, and the cost. At the top will also be noticed the words "High" and "Low," these being used to designate the high and low limit of stock—the amounts being written in. Following the headings referred to are spaces for a record of the goods received, showing date and quantity, goods taken from stock, and balance on hand.

By entering the quantities every day and extending the balances a perpetual inventory is provided. At the extreme right is a series of numbers from 1 to 20, extending from the top to the bottom of the sheet. These numbers represent the number of boxes taken from stock during the day, and are used to do away with the necessity of keeping a list which must be checked up at night.

In this store the key of the stock room is in charge of the manager, and no goods can be removed from stock without his knowledge. When a clerk takes a box of cigars from the stock room the manager places on the sheet over No. 1 a metal tab or marker, then if more boxes are removed during the day, the tab is moved down the sheet, and at night the number over which the tab rests indicates the number of boxes taken from stock. To provide for a record where over 20 boxes are removed in one day, which would only be the case in wholesale orders, a tab of another color is used. Those regularly used are black, while the emergency tab is red.

We will suppose that 22 boxes have been removed during the day; a red tab will then rest over "2," indicating that this number of boxes over and above the 20 have been used.

This is one of the most simple stock records that we have ever seen for such a business, and is handled with little labor. For the ordinary establishment we believe that the use of one of these small loose-leaf books will be found more practical than cards, as the entire output occupies but a small space, and the book can readily be placed in the safe at night.

With regard to keeping account with the stores, we submit as the first important item a purchase record ruled as per form illustrated, this book being the basis of the system so far as the cigar business is concerned. Cigars purchased on credit are entered in this book, each invoice being posted to the credit of the party from whom purchased, while the total of each "store" amount column is debited at the end of the month to the "store" accounts. This is where it is necessary to apply a little knowledge of bookkeeping, without which no efficient system can possibly be carried out, and we now proceed to outline the general system we have in view.

Stock and Purchase Record - Cigars

Date Received		Quantity	Price	Amount	Date Issued		Quantity	Main Store	Store #1	Store #2	Hotel #1	Hotel #2

FORM 2.

You will have noticed that the total of amounts purchased is posted from the Purchase Journal to the credit of "Accounts Payable Account." A column is provided on the "cash paid" side of the cash book for accounts payable, the total of which would be debited to Accounts Payable account. The balance of this Accounts Payable account (which will be kept on a card in the Liability section of the General Ledger) will then agree with the total of the balances of the separate creditors on purchase accounts kept in the front section of the General Ledger under guide cards "Accounts Payable." The trial balance is obtained entirely from the Assets and Liabilities, Disbursements and Revenue Accounts. (See Form 6.)

Instead of having the special columns in the purchase book for the different stores, however, it might be better to distribute the goods purchased over the departments, for the reason that the stores in bulk would in all probability be kept at the main store and distributed to the branches only as needed.

It is desirable to call your attention to the fact that in a business of this kind it is impossible to establish a system of accounting which will enable you to ascertain at any time the profit or loss made on each branch or department without providing for a certain amount of accounting detail. To ascertain the revenue derived from any particular source, it is absolutely necessary to keep an individual account of the revenues and expenditures in connection therewith.

The great points to keep in mind are:

1. A record of merchandise purchased, and of quantities and value distributed to each store.

2. A record of the sales made by each store, and profit thereon and of balance remaining on hand, and a check on the accuracy of this balance, or inventory of merchandise on hand.

3. An account with each store, which will show at any time the profits above mentioned.

Another method of arranging a purchase record is on the card system. A separate card is provided for each kind of cigar, while guide cards are

inserted to indicate where the record of purchases of a certain brand, and the various kinds of that brand, may be found. The record shows quantity, price and amount of goods received, quantity issued, and how distributed.

When the card system is used, it is necessary to make a recapitulation at the end of each month so that the proper amounts may be debited to stores No. 1 and 2, and the hotel stands.

Where a combination bound stock and purchase record is carried, it is not necessary that a business of this extent should carry individual accounts payable accounts. The total purchases at the end of the month may be credited to an Accounts Payable account, which will represent all those purchases, as above explained. The same plan can be carried out if the purchase and stock records are kept on the card system, by means of a recapitulation, as above indicated.

The ruling for accounts receivable and payable accounts, and all other accounts carried in the general ledger would be as shown on illustration Form 5.

ANOTHER PLAN.

An inventory of both main store and branches shall be taken. The total amount of each shall be charged to the branch store No. —(each branch having different number) or if preferred, charged to the clerk in charge of the store as if he were an independent dealer. The goods to be charged at the selling price at which every distinct article is to be disposed of. A price list being furnished to every branch by the main store. All merchandise, whether intended for the branch or for the main store, shall be purchased by the main office. The purchase orders will be issued in triplicate and numbered consecutively when printed, and signed by the purchasing agent. One copy goes to the receiving clerk or to the branch store for which ordered (if specially ordered), one copy to the party from whom purchases are made, and one copy kept in the office for the purchasing department file. Upon arrival of the goods, they are checked as to quantity, quality and condition, and if found to be correct, the invoice is signed by the receiving clerk, the copy of the purchase order is attached and forwarded to the Main Office where same is O. K'd for payment after being signed by the purchasing agent certifying that the prices charged are correct. The invoice is then handed to the bookkeeper who passes it through his Purchase Journal, which shall be ruled to contain a total column and separate columns for each item, viz.: books, magazines, stationery, newspapers and cigars, also return columns. The invoices are then filed away under their due dates for cash discounts. The posting from the Journal is made in detail to the Purchase Ledger. At the end of the month, the total is carried in the general ledger, crediting the total of the column to Accounts Payable Controlling Account and debiting the totals of each of the other columns.

The cash register's tape should be cut off, dated, signed by the manager, and forwarded to the Main Office together with the report. As the goods are

charged to the branches at selling price, the disturbing factor will be the "Box Trade" of the Cigars Department, as the sales of boxed goods are generally made at a reduction. The best way to arrive at an adjustment will be by means of a rebate for the amount of the difference. Each day a report of the cigars sold in boxes will be made on a form ruled for that purpose, showing the price of the cigars by the box, the retail price, and the amount of the discount. This sheet, together with the report of sales, is sent to the Main Office, where the branch store making said report, receives credit for the amount.

In the main store there is both a cash and a credit business. The credit sales being comparatively few in number. The accounting would, therefore, consist of purchases, expenses, cash sales, and credit sales. The manner of handling the purchases has already been described. With regard to expenses, the Cash Paid side of the Cash Book will be ruled to contain a column for each branch, so that, as much as possible, the expenditures in the way of salaries and other expenses made on behalf of the branches shall be debited to the branch expense account. General expenses which cannot be charged to any particular branch, should be pro-rated on the basis of turnover. With regard to cash sales, the same kind of Sales Book as those in use at the branches will be used in the main store. The clerk making the sale will forward the sale ticket together with the money to the cashier, who will enter both the quantity and amount on the daily recapitulation and distribution sheet. The amount of this sheet being the day's cash sales, will agree with the amount as recorded on the Cash Register. The total amounts of the different columns for the day's cash sales are entered in the Cash Book in their respective columns.

A good method of dealing with newspaper and magazine subscriptions is as follows:

When subscriptions, which are the credit sales of the business, are received, an account may be opened with the subscriber on a card ledger. These cards are arranged according to the carriers' routes, and can easily be changed around or transferred, should any customer move from one carrier's district to that of another. As these accounts fall due, combined bills and receipts are made in duplicate with carbon sheet. The originals are given to the carriers, or collector, who receipts and surrenders them as payment is received. These bill and receipt books are made with the original sheet perforated containing five or six bills and the duplicate sheet is unperforated with a heading and money column and constitutes what may be called the Sales Book. Use a separate book for each carrier's customers. The duplicate sheets are footed and forwarded until the totals for the period (month) are obtained, which are then credited to the respective ledger accounts and debited to Accounts Receivable account. When the cash is turned in by the collector his collection record is checked against the duplicates and the cash credited to the customers' accounts, through the cash book in Accounts Receivable column, total of which

is credited at the end of the month to Accounts Receivable account. The balance of this account then shows the total due from customers.

The branches may be charged with goods on hand, and subsequently sent them, at selling price. They will report daily amount of sales of each department, so that the difference between the goods sent them and the sales reported will be the amount of goods on hand at selling prices. This will compel branch managers to account for all goods delivered to them, and furthermore, they will not know the cost of goods and profits made on them.

It would be very desirable to require daily reports from the branches, accompanied by total daily receipts, a certain fixed sum being allowed each branch for the purpose of making change and for petty expenditures, this sum to be restored each day to its original amount.

By the method herein proposed, we expect you to use one general ledger which will contain accounts with creditors, and what are called "Representative" accounts, the latter being the accounts recording expenses and profits, assets, and liabilities. We do not suppose that you have a large number of accounts with creditors and would recommend a loose-leaf or card system, placing accounts with creditors in front and the representative accounts behind. (See Form 6.)

Monthly accounts with customers will be treated separately later on, and will be represented on the general ledger by one account entitled "Accounts Receivable."

STORE ACCOUNTS.

We have shown above that each store will be debited with the quantity and value of cigars furnished. It will also be debited with any cash purchases of cigars which may be made. These debts will come from the Cash Book and not from the Purchase Journal.

The account to which these purchases of cigars are debited will be called "Store Trading Account." (No. 1 or 2.)

Each store will furnish a daily report of sales, which will be taken from the cash registers, and the amounts of such sales will be debited to Cash on the general cash book (see Form No. 3), and credited to Store Trading

Dr Cash Book Cr.

Date	Particulars	Fol.	Accts. Receble	Sundries	Main Office: Cigars	Main Office: Rooms	Store #1	Store #2	Hotel #1	Hotel #2	Date	Particulars	Fol.	Accts. Payable	Sundries	Main Office Expense	Store #1 Expense	Store #2 Expense

FORM 3.

Account No. 1, Store Trading Account No. 2, Main Office Cigar Account and Hotel Stand Account.

We propose that all cigars debited to the stores shall be credited in two columns, the first column being at cost, and the second column at selling price. (See Form No. 4.)

The total sales added to inventory of cigars on hand should then always approximately agree with the value of cigars furnished to the store, while the difference between the cost column and the amount of sales and inventory will show the actual profit made on sales. This will provide a perfect check on the Cigar Department, and at the same time give you the desired statistics.

Dr. Store Trading Account - Cigars Cr.

Date	Items	Folio	Cost	Selling Price	Date	Items	Folio	Sales	Inventory Cost	Inventory Selling Price

FORM 4.

HOTEL STANDS.

The first hotel stand being run on a profit-sharing basis, the hotel proprietor will be credited at certain periods with his share of the profits as ascertained from the Hotel Trading Account.

With regard to the other hotel stand, this will be treated on the same basis as the branch stores, the Trading Account being debited with cost of cigars furnished, and salary of attendant, and being credited with sales, thus showing the profits made in the conduct of the stand.

NEWSPAPERS AND MAGAZINES.

As the majority of newspapers and magazines are received on sale or return, it would not be necessary to keep a record of receipts of same from the publishers, but a daily report of sales and returns should be obtained from each store, so that bills received can be checked up, and so that it may be ascertained that all papers and periodicals sold will be accounted for. These sales should be debited to cash in the general cash book, and credited to the accounts of the respective stores. (See Form No. 5.) The amounts paid for newspapers and magazines should be debited through the general cash book to the respective store accounts, or if accounts are kept with the publishers, it

would be well to use a separate section of the purchase journal in the same way as cigars are treated.

In this business, bills are not delivered with the papers and magazines, which have to be delivered either daily or weekly. This card would also be arranged to record price of the papers, amount to be collected per week, or month, the dates of commencement and discontinuance of subscription. Such a card can be cross indexed in various convenient ways, such as by streets, for the purpose of routing, or by names of papers subscribed for, thus making a ready reference to quantities of particular papers required, and alphabetically.

Dr. Store Trading Account- Books. Cr.

Date		Items	Folio	Debits		Date		Items	Folio	Credits		Balance	

FORM 5.

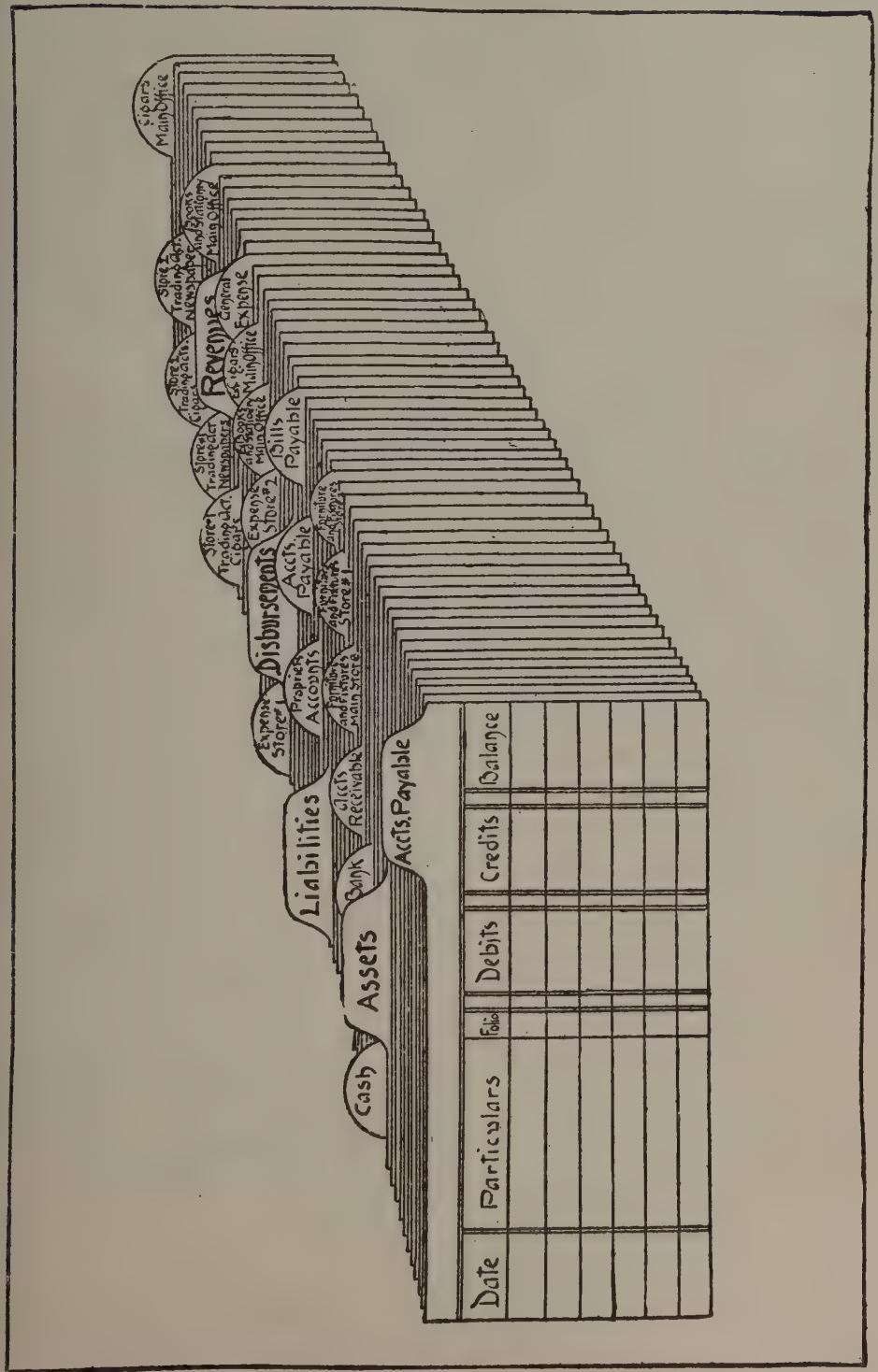
MAIN OFFICE.

In this store it is necessary to keep a Store account with the Book and Stationery Department in order to ascertain the profit made on that department. Separate columns will, therefore, be provided in the cash book as shown in form illustrated. The total receipts for the day should be entered in these columns, the total of the columns being posted at the end of the month to the credit of the Book and Stationery account in the general ledger. We presume that there are no credit sales for this department.

Cash purchases of books and stationery should be debited in the "Sundries" column, which is intended for all items for which separate columns have not been provided. This also holds good for cigars purchased for cash. These purchases should be debited in the "Sundries" column to whichever Trading account they belong.

It would be possible to provide special columns for these purchases, but we do not suppose there would be a large number, and think it undesirable to advise too wide a book.

In all these trading accounts, the difference between the debits and the credits, plus inventory, will show amount of profits made by each branch or department.


Cash
Assets
Bank
Accts. Receivable
Liabilities
Accts. Payable
Disbursements
Revenues
Date
Particulars
Folio
Debits
Credits
Balance

Form 6.

CUSTOMERS' ACCOUNTS.

A card system is used by a great many newsdealers in order to keep a record of their customers' names, addresses and the papers or magazines, but a statement is sent at the end of each month. We would, therefore, recommend that these statements should be made out in duplicate, and that the duplicates should be filed carefully away in alphabetical order in a convenient receptacle, and that the total of these bills should be debited to Accounts Receivable Account (see Form No. 6), which will be kept in the general ledger, and the balance of which account will represent the total indebtedness of customers in the same way as balance of Accounts Payable Account will represent your total indebtedness to creditors.

EXPENSE COLUMNS IN CASH BOOK.

These columns are intended for entries of wages, rent and supplies purchased for the particular stores or departments. Any expense which cannot be so classified should be entered in the general expense column.

Your monthly balance sheet and Profit and Loss account would then show as follows:

BALANCE SHEET.

ASSETS.	LIABILITIES.
Cash and Bank	Proprietor's Account (or Capital)
Accounts Receivable	Accts. Payable.
Inventories:—	Bills Payable
Main Store—Books and Stationery	Surplus.
Cigars	(to Proprietor's Acct.)
Store No. 1—Cigars	
Sundries	
Store No. 2—Cigars	
Sundries	
Furniture and Fixtures	
Main Store	
Store No. 1	
Store No. 2	

PROFIT AND LOSS ACCOUNT.

Dr. EXPENDITURES.	Cr. REVENUES.
Store No. 1 Expense	
	Store No. 1:—
Store No. 2 Expense	Trading Acct.—Cigars,
	Trading Acct.—Newspapers, etc.
Book Dept. Expense	Store No. 2:—
Stationery Dept. Expense	Trading Acct.—Cigars,
General Expense	Trading Acct.—Newspapers, etc.
Surplus (to	Main Office—Books and Stationery
Proprietor's Acct.)	Main Office—Cigars

GENERAL LEDGER.

The illustration of card ledger, Form 6, is intended to give you an idea of the "Sundries" or "General Ledger," which would be the only ledger you would keep. This device not only does away with an index, but provides in-

stantaneous reference. The accounts always remain exactly in the same order, and if a card becomes filled it is simply necessary to insert another card.

The cards are arranged in the order in which they appear on the financial statements, and if it is desirable to change this order, the accounts can also be changed.

Each section of this ledger can be proved separately by providing separate columns in the cash book, journal and auxiliary books.

Thus the total of debits and credits to expense accounts in cash and journal, etc., will equal the total debits and credits posted to the expense section in the ledger.

This is the summary of the plan:—

1. Head office does all the buying, distributing, paying and accounting.
2. Debit each branch monthly for retail price of goods in stock.
3. Credit each branch for payments as per slip returns.
4. Debit each branch for its expenses paid and credit for vouchers of same.
5. Balance monthly.
6. Prepare comparative statement monthly.
7. Debit each store again for retail list of goods on hand, having taken double inventory, one at cost, the other at selling price.

Keep uniformity in all the branches by frequent visits.

(330) AN ACCOUNTING SYSTEM FOR THE REAL ESTATE BUSINESS.

Since the chief features of Real Estate work are in the purchasing of property for development, sale and rental—the most important points to be considered, are, prominent or advantageous location of the property, the physical surroundings, price, terms of sale and incumbrances, such as mortgages, liens, unpaid taxes, assessments, etc.

Having satisfied yourself as to the clearness of the title, the abstracts examined and deeds filed, plans can be laid to turn the property to some source of income. In the case of a tract being bought for subdivision into building lots, the land should be surveyed by a competent engineer and as soon as the plat meets the approval of the proper city authorities, preparations can be made to induce sales, and at the same time to provide the proper records for handling the accounting features of the work.

Considering that an ordinary piece of ground was purchased for development purposes to subdivide into building lots, where payments were to be made in cash and notes, followed by mortgage, we might have an entry, for example—

Benlow Addition—
To Cash—
To Bills Payable.
To Mortgage Payable.

Care should be taken to have a reliable attorney (there are always a number in every city whose work in abstracting and writing deeds is considered an authority), draw up all the legal forms and pass on all contracts.

As soon as a lot has been sold, the Journal would show an entry as follows:

John Jones ——
To Benlow Addition ——

In a great many cases at the present time, lots are sold on the installment plan, the interest and taxes being carried by the owner of the Tract, and generally the deed is not passed until the lot is paid for. At the time of securing the lot, the purchaser is given a Land Contract, wherein he agrees to make certain cash periodical payments until the lot is completely paid for. It also contains ordinary articles of agreement, signatures, of the parties concerned, binding heirs, administrators, etc.

Form No. 1 would serve in a general way for the cash and journal entries. If the items were numerous and covered the handling of a large tract, it might be well to carry the detail in auxiliary books and the totals only would be entered in the Cash Journal. Where several tracts were operated, separate records could be maintained for each tract. If the tract was to be subdivided, some of the costs in securing and laying out same would be as follows:

Acquiring—

Purchase, interest, recording and filing, costs of maps, clerical and legal help.

Maintenance—

Taxes, printing and advertising, grading, fencing, and sign boards, transportation, telegraph and telephone, labor, freight, express and drayage, and general up-keep of the property.

Improvements—

Tree planting, seeding and sodding, sewers, walks, roads, driveways and streets.

Cash - Journal

Date	Dr.	Cr.	Cash		Benlow Add		Const'n		Bills Pay		Bills Rec'd		Int		Misc		Bank	
			Dr.	Cr.	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.

FORM 1.

Form No. 2 might be used as a daily cash book for recording payments made on lots and posting of items would be made to the purchasers' accounts, kept on loose-leaf ledger sheet, as shown on Form No. 3. Space is here provided for one or more payments made in any one month. In case the contract of sale specifies a certain amount to be paid each month, the overdue column will show the amount in arrears at any time. Each sheet is ruled to cover six years when printed on both sides.

Date	Name	Addition	Amt. Pd.	Int. or Com.	Total Paid	

FORM 2.

Name _____ Addition _____

Address _____ Lot No. _____

Value _____ Terms _____

Months	1st Date	Amount	Over Due	2nd Date	Amount	Over Due	3rd Date	Amount	Over Due
January									
February									
March									
April									
May									
June									
July									
August									
September									
October									
November									
December									
Total									

FORM 3.

For the protection of the purchaser and as a check for the cashier, the outline shown on Form No. 4 should be printed in book form about the size of the ordinary bank pass-book. This shows the payments made and acts as a receipt for the same.

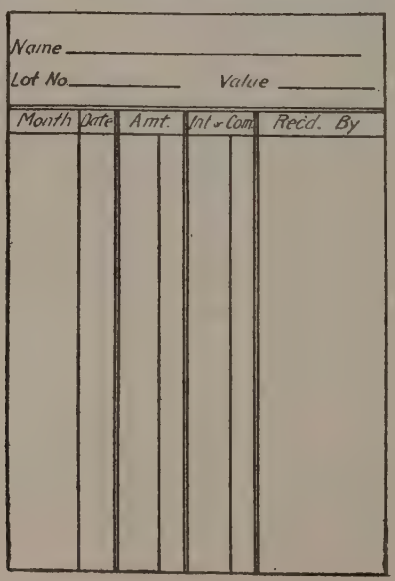
Firms engaged in the rental business should provide three kinds of records:

1. Account with the tenant.
2. Account with the owner.
3. Account with the property.

The account with the tenant will show rent accrued and collected. This account should be carried on a card as ruled on Form No. 5, showing dates at the top when promises of payment are made, indicated by small pointers or tabs; tenant's name, rate, references, owner's name and location of the property; date of payment, totals paid, amounts overdue and date credited owner. Card should be printed on both sides and thereby serve four years. This form is very desirable for the reason of the complete cross indexing possible. Form No. 5a should appeal to those desiring accounts kept in book form: has columns for the dates of promises to pay; renters moving in and out of a property would not necessitate a new sheet for each one's account—space is provided for the date occupied and the date vacated, and the name of the renter.

Accounts with the owner should be carried on loose-leaf ledger sheets, printed as on Form No. 6. This form shows the amounts paid the owner, deductions on account of expenditures for repairs, etc., or commission on collections and dates and amount of collections. If printed on both sides of the sheet, one sheet will cover eight years business. When rendering periodical statement of account to the owner, charge his account and credit a controlling account in the general ledger.

The account with the property will show the items of expense in keeping the property in repair. This can be carried on loose-leaf ledger sheet,



FORM 4.

printed as Form No. 7, in the same ledger binder as landlords' account, each property account following that of the owner, and to be distinguished by a different color of paper. In case the landlord has more than one property, carry an account with each and designate additional accounts by letters a, b, c, etc.

The cash book for rental collections should have columns showing date, name of tenant, name of owner, cash received, amount to tenants ledger, commission, amount due owner. Totals of these columns can be carried to the representative account in the General Ledger.

Cards printed as on Form No. 8 should be provided for the office, listing houses, lots and farms for sale or rent. These cards should be printed on different colors of paper, one for each kind of property.

If the forms listed in this article are printed and used as shown, there is no doubt but what the result will be entirely satisfactory.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

Tenant _____ Location _____

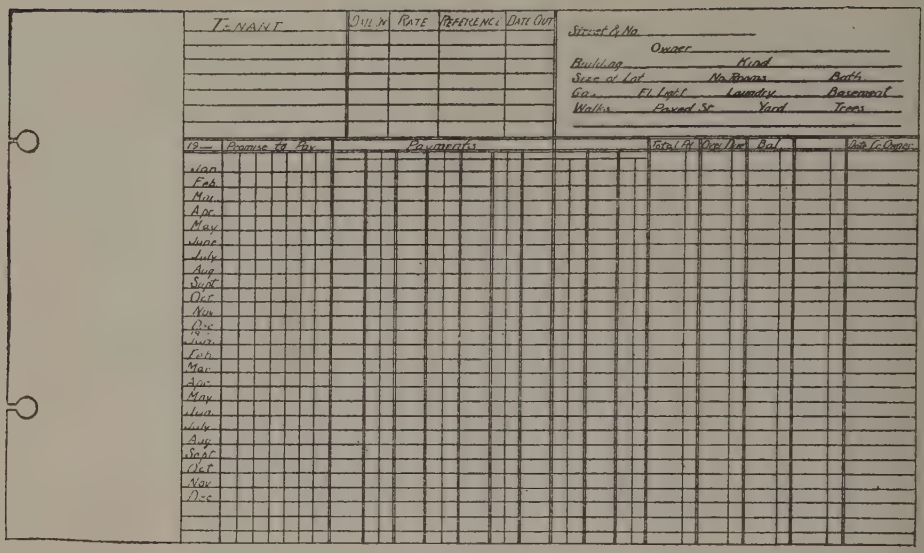
Rate _____ Owner _____

Reference _____

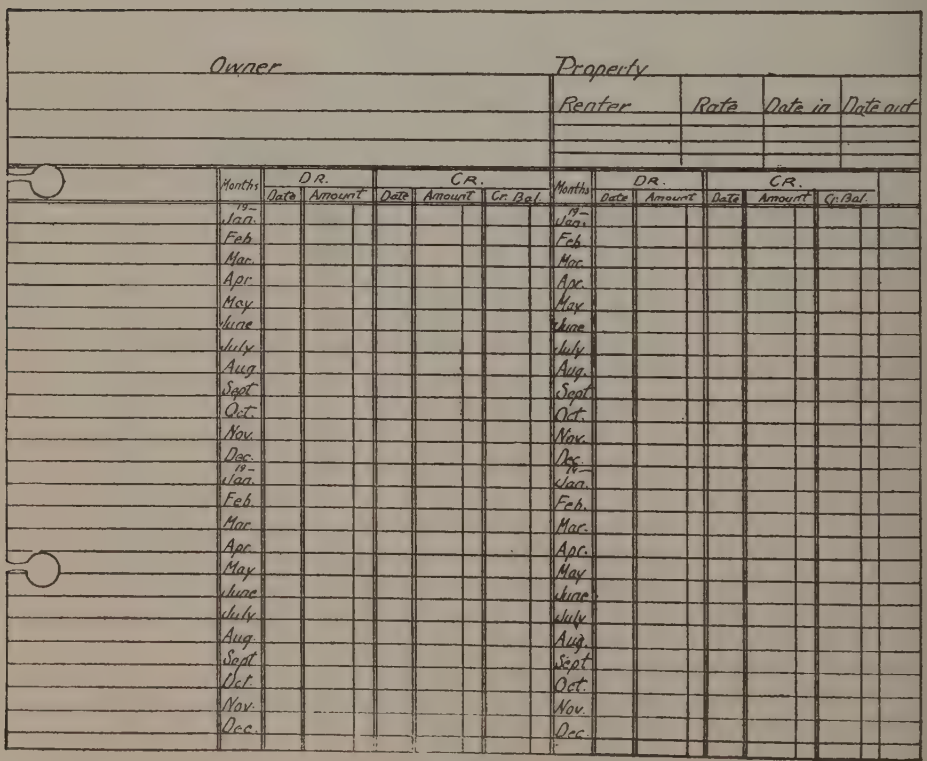
Date in _____ Date out _____

Months 19	PAYMENTS										Total Paid		Bal.		Over Due		Date to Owner
	Date	Amt.	Date	Amt.	Date	Amt.	Date	Amt.	Date	Amt.							
Jan.																	
Feb.																	
Mar.																	
Apr.																	
May																	
Jun.																	
July																	
Aug.																	
Sept																	
Oct																	
Nov																	
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Apr.																	
May																	
Jun.																	
July																	
Aug.																	
Sept																	
Oct.																	
Nov																	
Dec.																	

FORM 5.



FORM 5a.



FORM 6.

Property Owner
Renter
In Out

EXPENDITURES

Date	Workman	Papering	Plumbing	Roofing	Misc.	Total	Date Chg. Owner

FORM 7.

Property Location
Size of Lot Side St Water
Sewer Gas El. Light Telephone
Paved St No. rooms
Kind of House Cellar Attic
Walks Shade trees

Price Mortgage
Terms of Sale
Remarks

Owner Address

FORM 8.

EXERCISES.

1. A Candy Manufacturing Company uses the following raw materials in the process of manufacture:

Glucose
Sugar
Starch
Flour
Cereals
Flavors
Color

The completed product is delivered or shipped in pails, boxes or barrels.

Submit sketches of purchase record with suitable distribution columns, and comparative statement in relation to standard units established.

In this business, owing to frequent requests for samples, their cost is an important item. The requests come by mail and through salesmen. Suggest best treatment of this feature of the business.

2. The manufacture of candles involves several by-products obtained in the process of production, such as stearine, etc., the standard unit of candles being usually 100 pounds.

State how you would deal with stearine in relation to quantities and values obtained, and explain methods of distributing general factory expense in connection with the by-products.

3. A Consignment of machinery, or implements, is returned by the customer to the manufacturer as defective, said defects to be remedied or new goods supplied. Explain the proper treatment of these returns, including receiving and stores departments and factory.

4. Draw up a form for the record of accounts of a small trading business, that may be used as a combined cash book, journal and general ledger. Give the headings and provide five distribution columns for expenditures; also, columns for controlling accounts for both accounts payable and accounts receivable. Make entries therein to cover the following transactions:

Nov. 1.—H. W. Patten began business and invested: Cash $5,000; Merchandise $1,800; Accounts Receivable, Tom Brown $110, John Doe $84.50, Sam Smith $120.50; Accounts Payable, W. O. Easton $64.50, W. W. Wood $50.50; his note for $500 favor First National Bank.

Nov. 2.—Purchased Merchandise from J. J. Kirk $340, and gave check for $150 in part payment; paid rent of store one month $200, and for general expenses $35.40; bought for cash, furniture and fixtures $400; sales to Tom Brown $45.20, and to O. E. Sparks $130.

Nov. 4—Bought Merchandise from W. Stover $348.50, and paid on account of same $200; received of Tom Brown cash to apply on account $100, and from John Doe in full of account; paid freight $28.60, for advertising $35.40, for petty expenses $10.50; cash sales $350.

Nov. 5.—O. E. Sparks settled his bill of the 2nd, less 2 per cent. discount; H. W. Patten took out cash $100, and merchandise $50; sold mer-

chandise to C. L. Butler, $160.40; cash sales, $280; paid salaries, $200; cartage, $3.60; insurance premium, $30; cash is short, $1.30; paid W. Stover balance due on bill of 4th, less discount, $6.90.

5. In a manufacturing business it is suspected that the wages paid in one particular department vary from month to month a great deal more than they should if conditions were normal. State how you would ascertain the percentage of the variation and the cause.

6. A company of bicycle manufacturers make up its accounts on Dec. 31, 1908, for the year. The following are the debits to the trading and profit and loss accounts:

Raw material on hand, January 1, 1908	$12,500
Finished machines on hand January 1, 1908; 1,600 at $30	48,000
Purchases of material	62,500
Labor, Productive	82,500
Manufacturing expenses: coal, repairs, unproductive labor, etc.	23,000
Agents' commissions	90,000
Branch expenses, rents, salaries, etc.	40,000
Selling expenses, travelers' salaries, discounts, rebates, etc.	30,000
Bad debts	8,000
Depreciation of machinery and plant	5,500

The sales for the year were 6,000 wheels, yielding $540,000.00. The raw materials on Dec. 31, 1908, taken at cost, was $4,000.00, and the finished wheels in stock ready for sale numbered 800. Prepare an account from the above showing: (a) number of wheels manufactured; (b) the cost per wheel; (c) the gross manufacturing profit; (d) the final net result, including in the trading account the stock of finished wheels on hand December 31, at their cost as shown by the accounts.

7. From the following trial balance of the Excelsior Ribbon Company, prepare trading and profit and loss accounts for the six months ending June 30, 1908, and balance sheet for that date:

Capital Stock—		
Preferred, 250 shares at $100		$ 25,000.00
Common, 300 shares at $100		30,000.00
Machinery	$ 24,500.00	
Inventory, Dec. 31, 1907	78,620.15	
Accounts Receivable	63,428.30	
Materials Purchased—		
Silk (raw, spun and thrown)	124,326.80	
Ribbon Paper, Boxes, Labels, etc.	3,728.05	
Labor—		
Weaving	29,384.07	
Throwing	10,976.25	
Dyeing	8,563.43	
Warping, Winding, etc.	15,721.18	
Fixing and Preparing Looms	1,270.60	
Sales of Ribbon, less returns		265,123.74
Sales Miscellaneous		2,507.26
Discounts on Purchases		120.56
Profit and Loss—Surplus—Dec. 31, 1907		23,528.71

General Expenses—		
Salaries, Officers and Clerks	5,238.75	
Engineers, etc.	2,068.17	
Rent of Mill	2,500.00	
Commissions	17,856.50	
Fuel, Lighting, etc.	2,370.60	
Other Expenses (including Ins., $285)	7,650.39	
Bills Payable		57,235.95
Interest on Bills Payable	1,586.36	
Accounts Payable		6,875.95
Cash in Banks	9,876.25	
Cash in Safe	726.35	
	$410,392.20	$410,392.20

In your statements provide for the following: Dividends declared at the rate of 3½ per cent. on preferred stock and 3 per cent. on common stock; depreciation on machinery, 15 per cent.; prepaid insurance, $48.25; labor accrued but not due (estimated), $1,850; taxes accrued but not due (estimated), $250; inventory, June 30, 1908, $96,385.50.

LESSON XII.

AUDITING.

LESSON XII.

Auditing.

(331) THE WORK OF AN ACCOUNTANT.

The profession of the accountant is not overcrowded, as are the professions of the law, medicine and other arts. One reason, perhaps, that it is only to-day emerging from its infancy is that accountancy owes its growth to the enormous expansion of business, and also to the creation of manufactures and industries that were unknown to our forefathers.

There is another important reason why the accountancy profession has doors open for the aspirant, and that is because there are at the present day only a comparatively few of the leaders of the commercial world who avail themselves of the services of the professional accountant.

What is the work of an accountant? The word book-keeper is often confused with that of accountant—that is, the professional accountant. The architect designs a house and the builder builds it; so the accountant designs sets of books, and the book-keeper keeps them. The book-keeper himself may understand that part of the work as well as the accountant, but it is only a small part and his opportunities are limited and generally confined to one branch of business.

The designing of books then for all branches of business is an important part of the accountant's work. He has to know from experience which are best and to consider further how to effect savings by avoiding any unnecessary work and yet giving all the information required, and providing safeguards for checking cash and other assets.

The best book-keeping is usually simple and easily understood. And the book-keeper who can give his employer periodical and concise particulars of the transactions is the man who is going to succeed. Another important part of an accountant's work is the investigation of the accounts of a concern in which his client may wish to invest capital, or become a partner.

In all such cases as this the basis of examination is the balance sheet and the profit and loss accounts. The accountant has to satisfy himself that the profits as shown have been properly earned. He has to ascertain if the profits are increasing year by year, or the contrary; that the assets actually exist as shown on the balance sheet, and that all the liabilities have been disclosed; that the inventories of the merchandise, etc., are taken at the same valuation, or on the same principle, as in former years, and that the same are correct.

A few years ago a client of mine came out from England with a view of investing a considerable sum of money in a manufacturing business in Canada. He had been furnished with balance sheets for several years and from the increased capital in the last year as compared with the first year

he judged that good profits had been made. He further had a favorable report from an English accountant based on these balance sheets.

This particular business was quite a distance away, so I fixed a time with him when we should go and see the books. He left the balance sheets with me, and in comparing them year by year I noted that real estate in one year had increased about 100 per cent., and that in each year machinery and plant kept increasing in value.

When investigating the books I found that real estate had been written up, and that all repairs to machinery were capitalized instead of being charged as an expense, and that no provision was made for depreciation; that a number of bad debts were being carried as good assets, and that the business instead of making profits was losing money. My client did not invest his money. A year afterwards, when I happened to visit the town, I found the establishment closed, as I had quite expected, and yet this concern had produced what was apparently a good balance sheet. I need hardly say that no accountant could advise a client to have anything to do with a concern that did not keep proper books of account.

One can judge of the prosperity of a factory by its surroundings, offices and well-kept books, neat and orderly work-shops, all showing the master mind ruling and regulating all the necessary details.

Another important part of an accountant's work is preparing cases for the law courts. It is necessary for the accountant to know the general principles of commercial and statutory law to a considerable extent.

One point the accountant has to be especially careful about, and that is not to do work which does not appertain to him. He must not do work which should be done by a lawyer. The legal and accountancy professions work alongside of each other and at times very close together. The up-to-date lawyer would hardly take any important case where accounts are concerned into court without the co-operation of an accountant.

Accountants, like doctors and lawyers, become specialists, more or less, and every accountant's business has the tendency to increase in one given direction. One accountant becomes known as an expert in factory cost accounts; another has more of the legal mind, and so on. In fact, the scope of the accountant's business is so large that marked ability in any one direction must attract to that man a large share of that particular class of business.

Legal work is to some accountants specially attractive, while others are quite unfitted for it. Any accountant who has to appear in court should be very careful to have all his facts and evidence carefully prepared; and if he has to produce accounts let them be very clear, and very simple, as many a case has been lost in the courts by the judge not understanding the accounts as presented to him.

Another most important branch of an accountant's work is that of auditing. There are several standard works on auditing, and every student in accountancy must study and master the theory of auditing. What an important and responsible position is that of the auditor! He must thor-

oughly understand, and himself be able to do all the work he is called upon to audit. He has to see that all the accounts as presented to him are correct in fact, as well as in principle. He makes himself responsible for the correctness of the balance sheet as certified to by him.

His work must be characterized by care, vigilance, and knowledge, and yet he must remember that he is not a detective. The auditor counts the cash on hand at any given date, not because he doubts the honesty of the cashier, but because he has to certify that it is correct. He must be able, at times, when such a course is necessary, to refuse to certify to statements which are incorrect or misleading.

His character must be undoubted, and his reputation so good that his signature attached to any balance sheet is a guarantee of its reliability. And yet how many shareholders seem to think that the appointment of an auditor to audit the accounts of their company is a small matter and they appoint some friend to the position, regardless of his qualifications.

What a field of work is open here for the accountancy profession, and what an opportunity for the accountants in guaranteeing that the public have honest and true balance sheets presented to them! "Honesty is the best policy," and in no profession is this so well exemplified as in the accountant's.

Very briefly the work is verifying all the items which compose the balance sheet:

1. That the assets actually exist and are properly valued, and these assets include accounts and bills receivable.

2. That all the liabilities are shown—provisions made for outstanding wages, rents, taxes, etc.

3. That this balance sheet agrees with the books.

4. That all proper depreciations have been provided for on machinery and plant, buildings, patent rights, etc.; also provision for bad and doubtful debts.

5. The auditor should see that the balance sheet clearly shows by its headings the nature and class of all assets and liabilities.

6. He must trace all these transactions and balances right back to their original source as far as possible.

7. And he must be able to certify that he has audited the books and accounts, and that he believes that the balance sheet shows correctly the position and standing of the business on the given date. If the auditor disagrees with the management on any point, let him be quite clear he is right, as he will refer to this in his report.

8. The auditor must never forget that he is not managing the company; therefore, he is not responsible for that—he audits their accounts and certifies to the result.

Other branches of the work of an accountant are in connection with bankruptcy, arbitrations, municipal work, special calculations, etc.

Partnership accounts, also, and the adjusting of the accounts as be-

tween partners, is a very important branch of the work. As I have said before, the balance sheet is the basis in nearly all accountancy matters. Needless to say, underlying all is the tracing of cash through the books.—*From an address delivered at the opening meeting of an evening class at the Detroit Business University by Wilton C. Eddis, F. C. A.*

(332) THE OBJECT OF AN AUDIT.

Periodical examinations of the accounts of commercial and financial institutions, special examinations for prospective investors, investigations on behalf of creditors and trustees in bankruptcy, examinations to ascertain the cause of decreasing profits, exhaustive audits preparatory to installing improved systems of financial cost accounts and investigations of the accounts of public officials at the behest of dissatisfied citizens, are but a few of the many purposes which clients have in mind when desiring to have accounts of an undertaking audited.

The object of the auditor should be, in the main, threefold: (1) Detection of fraud. (2) Discovery of errors of principle. (3) Verification of the mechanical accuracy of accounts. As has been pointed out by many writers, the attempted concealment of fraud must be accomplished by commission of either an error of principle or one in the mechanical work of the accounts; owing, therefore, to its importance, and often its predominating importance, the detection of frauds is conceded a separate place among the objects of an audit. From first to last it is the auditor's duty to be on the lookout for fraud. Nine times out of ten the client who determines upon an audit suspects no one in his employ in the slightest of dishonesty, and yet experience teaches that in nine cases out of ten it is where they are least expected that fraud and dishonesty are discovered. This should not be taken to mean that all the employees in a client's office are to be suspected of being rogues masquerading as honest men—on the contrary, every man is held to be innocent until proven to be otherwise—but it does mean that the auditor must be vigilant and not forget that occasionally, or we may even say frequently, "appearances are deceitful." Errors of principle are as often found to be errors of omission as of commission, and it is here that an initial audit most often bears its fruit. As regards verifying the mechanical accuracy of accounts, it is, of course, preposterous to suppose that an auditor in the limited time at his disposal could be expected to verify every footing, every posting, and all the other routine details of a set of accounts. The verification incident to and necessitated by the attainment of the first two objects is usually sufficient to reasonably satisfy him of the correctness of the accounts from this standpoint.

(333) THE CONDUCT OF AN AUDIT.

When an audit is being made for the first time it will be of great advantage to the auditor to go thoroughly over the system in force, the methods employed to gather the information necessary to the proper admin-

istration of the accounting department, the manner in which it is treated after obtained, whether intelligently or otherwise; the safeguards, if any, against error, intentional or unintentional; further, whether, in the case of manufacturing and mercantile enterprises, any system of stock accounts is kept, and in the case of the former a cost system, and whether they fit into the scheme of the general accounts or are in any other way of assistance. It is also desirable that he familiarize himself, at least in a general way, with the business of his client, ascertaining in the case of a commercial undertaking for instance, the articles manufactured or handled, the average rate of profit which is expected to be earned, and the numerous other matters that will suggest themselves.

Succeeding this preliminary survey, the mode of procedure should be mapped out, and this in considerable detail. It will, of course, not be possible to determine in advance all the work that should be done, as the results and observations made during the progress of the audit will call attention to much of the detail which it may be desirable to go into, but there is no question that a well laid out plan will greatly facilitate and simplify the work in hand.

(334) VERIFICATION OF THE BALANCE SHEET.

Ordinarily, the work of the audit will naturally run in two channels—viz., the verification of a Balance Sheet on a date specified and the examination of the Profit and Loss or equivalent account for a period or a number of periods ending with the date of the Balance Sheet.

A Balance Sheet is a statement of assets and liabilities as of a given date, hence an audit of it will embrace (*a*) the verification of the existence of the assets, also ascertaining whether any have been omitted, and, as far as it lies within the province of the auditor, their values, or at least of the *bona fides* of those whose statements of value are open to question and the methods of arriving at the same; (*b*) the verification of the existence and amounts of the liabilities and ascertaining most particularly that there have been no omissions, either of contingent, accrued, or direct liabilities.

(335) ASSETS.

Of the assets the cash naturally suggests itself as the item which should be verified at the earliest possible moment. Bank balances should be proved by reconciliation of the balance per Cheque Book with Bank Pass Book, which should be balanced at the time of the audit, or, if the Pass Book is used as a record of deposits only, by procuring a certificate or statement from the bank. Cash and cheques on hand should be counted, the latter being carefully scrutinized as to date and also as to entry in Cash Book; if this precaution be omitted it is possible to conceal a shortage by submitting as part of the cash balance cheques which have not as yet been entered. Memoranda, I. O. U.'s, etc., should be noted, attention being given to the

question of the authority of the cashier to make advances or other payments on memoranda. Where cash is on hand in several different departments, as, for instance, in a bank, it is important that, as far as practicable, the counting of the cash proceed simultaneously in all the departments, otherwise cash already counted in one department might very easily be transferred to another department, unknown, of course, to the auditor, included as part of the balance in the later, and thus a shortage be concealed.

Accounts receivable are, in many instances, quite trying to the auditor and call for special attention both as to their genuineness and value. Where it is practicable for the auditor to send out to the debtors, or examine before they are sent out, statements of their accounts, this is the most satisfactory way of verifying them, and especially so if provision is made for acknowledgment (addressed to or marked for the auditor) of their correctness, although there is almost a certainty of some recipients not making any acknowledgment. In some cases, such as that of stock brokers, this method is absolutely essential, as in no other way can the auditor satisfy himself that the accounts are correct as stated on the books, particularly in the item of collaterals which are carried on the accounts. In a mercantile business the balances should be earmarked as consisting of certain unpaid bills, the most recent in due date. "Slow pay" and overdue accounts and those on which payments are made in round sums with very infrequent settlements should be closely scrutinized, as it is possible that the operation of "woshing" is being carried on—that is to say, payments are being received when due, but the earlier collections having been misappropriated such cash credits as appear on the books are made from subsequent collections, or, in rare instances, where the use of misappropriated funds is allowed by success, by restitution. Bad and doubtful accounts should be investigated before being charged off to make sure that they have not been collected and the moneys misapplied. The old practice of charging off bad accounts to profit and loss without keeping any further record of them is a poor one, and is being gradually abandoned. Where bad accounts are charged direct to Profit and Loss instead of to a Suspense Account, they should be entered in a memorandum book, together with all particulars relating to them, so that they can readily be followed up and any possible future value be realized.

As has already been noted, accounts receivable should be examined for their value as well as genuineness, and a suitable reserve provided for such as are bad or doubtful. It is best to err on the safe side and make the reserve too large, rather than the reverse. In "lean" years clients are very apt to omit making any reserve for doubtful debts, contending that they will be collected "some time," and the auditor cannot urge too strongly the necessity of making proper provision for them.

Where accounts consist mainly of installments payable on sales made on the lease agreement plan—the article sold to become the property of the lessee upon payment of the final installment—a tabulated record of these

sales showing total amount of each sale, terms of payment, etc., is much more convenient, and lends itself more easily to an intelligent examination than the ordinary form of ledger. To confirm the existence and amount of the accounts the agreements themselves, which are signed by the customers, may be examined and compared with the record. The question of doubtful debts is especially important here, as, with few exceptions, there is sure to be loss on some of the accounts.

Bills discounted, and time and call loans, which form the largest item of a bank's assets, should be scheduled, together with the collateral pledged with them, both the notes and collateral themselves being examined or verified by letter as to items which may be in the hands of correspondent for collection or other cause. The bills discounted should be separated into one-name and two-name paper, and the customer for whom discounted indicated. The value of collateral on loans should be shown as far as practicable; where it consists of securities listed on a Stock Exchange, this is comparatively simple; but in the case of securities which are not listed, such as those of "close corporations," or warehoused goods other than those dealt in on "Change," it is not so simple a matter, and, in some instances, not practicable for the auditor to attach and value.

(336) INVENTORIES.

The subject of inventories of materials and manufactured products is one of great importance in those businesses of which they form a part. Their verification seems to be somewhat akin to that of pay-rolls, in so far that the most efficient check is to have a number of different people concerned in and held responsible for their make-up. Generally speaking, it is not possible for the auditor to verify the quantities of materials on hand, and he is, to this extent at least, at the mercy of those preparing the inventory. In some very unusual instances the auditor is requested to have one of his assistants present to verify the counting and weighing of the stock on hand, but even in such a case he cannot vouch for the quality of the materials or products. Where the force of clerks is large enough to permit it, the work of taking count of the quantities, pricing, and making the extensions and footings, should be assigned to separate employes, who should be required to certify separately in writing to the work performed by each of them. The footings should be checked by the auditor's staff, and the extensions at least roughly.

The inventories should be analyzed and compared with those of previous periods, both as to prices and total values, and any marked changes inquired into. Prices of raw materials can be verified by comparison with purchase invoices; where cost accounts are kept, the prices of finished goods can be readily verified; if no cost accounts are kept, it may be somewhat more difficult, but, at all events, it should be seen to that there is a margin between the inventory and selling prices of finished goods. The items forming the basis of valuing manufacturing products should be

scrutinized to see that no expenses which have not been actually incurred are included. For instance, in the case of a publishing house, it it usually the rule to pay royalties to authors only on the books actually sold; to include the royalty as part of the cost of unsold books would not be correct unless the royalty had been credited on Book Account.

Under the heading of "Plant," which may be expanded to include rights of way and tracks of railway companies, together with locomotives, cars, and other equipment, we have a subject which from its very size attracts much attention. It is the consensus of opinion among accountants that an auditor cannot be expected to act in the capacity of an appraiser, and determine the actual value of the plant of the concern he is auditing. He should, however, examine very carefully all entries in the books relating to this account; the minutes should be consulted regarding all issues of capital stock which may be charged to it for purchase of plant or equipment; charges for extensions and additional machinery, etc., during the period under review, should be looked into to make sure that no replacements are being charged to this account because they may happen to run into large amounts; sales of worn-out plant items, such as old boilers, must be verified as having gone to credit of Plant Account and not to some operating account, unless the original cost, or depreciated cost (if depreciation has been provided for), be charged off at the same time. Extensions are, at times, quite difficult of verification when the concern does its own construction work, as is largely the case with railway companies, and the materials and labor charges are of exactly the same nature as those for repairs and renewals. In such cases the character of the extension and the value should be certified to by the engineer or other competent authority.

(337) DEPRECIATION.

Depreciation must be considered in relation to statement of property value. The number of instances in which depreciation is properly provided forms an exceedingly small percentage of the grand total of business enterprises. The auditor cannot, of course, compel his client to provide for depreciation, but he should certainly call attention to its great importance, both as to its effect in properly stating the Balance Sheet and the earnings, and if no provision is made attention should be specifically called to the fact in the report submitted. The amount or rate of depreciation to be allowed in various undertakings cannot, of course, be gone into in this limited space nor under such a general heading as that of the subject under discussion.

(338) OUTSIDE INVESTMENTS.

Investments in mortgages, stocks, bonds, etc., should be verified by examination of the securities, or by correspondence if pledged as collateral on loans. Their cost can be verified by the vouchers for the expenditure

made for their purchase. It is well to note the number of registered securities, so that at the time of the succeeding audit, if no change appears in the book accounts of the same, the auditor may satisfy himself that there has been no unauthorized use of the same in the interval. It would be found convenient, when the investments are not liable to be disposed of for some time, to place them in envelopes sealed with the auditor's private seal and their contents marked on the envelope by him. The unbroken packages do not then have to be examined during every audit.

(339) ADJUSTMENTS.

Prepaid and accrued expenses, such as insurance, taxes, wages, etc., which may rank as either assets or liabilities, are usually not very difficult of verification. The unexpired insurance may be readily proven by scheduling the policies in force with the total premium paid on same and calculating the value that the unexpired portion of the term bears to the whole. When the fiscal year of a business subject to taxation is not coincident with the calendar year, or the period under review is not an even year, prepaid or accrued taxes form an item in the Balance Sheet; if prepaid, their verification is a matter of simple arithmetic; if accrued and the amount of the assessment and the tax lexy be known, it is likewise quite simple—if the current year's taxes are not yet known the preceding year's will have to be taken as a basis of calculation, due allowance being made for any expected increase of assessment or levy. Accrued wages may be roughly checked by comparing the proportion of the next succeeding pay-roll which the accrued period bears to the whole pay-roll period, and so on *ad libitum*.

(340) LIABILITIES.

The audit of the liabilities is not of less importance than the audit of the assets. This aspect of the examination demands that great care be taken, as liabilities are more often omitted from the Balance Sheet than assets. The usual items of liabilities are accounts and bills payable, bonds, mortgages, revenues collected in advance of being earned, such as discount on unmatured notes held by banks, subscriptions paid in advance, etc., and accrued expenses. The proving of accrued expenses has already been spoken of in the preceding paragraph and need not be dealt with again, except to say that the auditor should be certain that all accrued accounts of whatsoever nature have been included; the verification of revenues collected, but as yet unearned, is in general not very complicated, and is generally more a matter of arithmetic than anything else.

As regards accounts payable, the most frequent error in practice is one of omission, and consists of bills for goods actually received and included in the inventory of stock on hand not being entered in the books during the same fiscal period. Where a good system of stock accounts

is in use, or a method of checking back a record of goods received with the Purchase Book or the invoices themselves, this is not so liable to occur, but in a concern where neither of these things obtain, especial vigilance is needed on the part of the auditor to satisfy himself that no bills have been omitted. A good way of verifying the accounts payable is to check back the vendors' statements with the Ledger, any bills appearing on the statements but not entered on the books being carefully scrutinized as to their dates and the dates of the receipts of the goods, which latter should be subsequent to the date of the taking of the inventory, otherwise the bills should have been entered.

Unpaid notes per the Bills Payable Book should be totaled and the aggregate compared with the Ledger Account. In the case of collaterals being pledged on the loans, the holders should be communicated with for confirmation of the loans and the collateral. This is especially important in the case of stock brokers and similar houses where the balancing of the stocks is an important feature of the audit.

In the matter of bonds or mortgages the minutes of the concern, if it be a corporation, should be consulted for authority bearing upon their issue, rate of interest, etc. The bond and mortgage should be read through to see what provisions regarding sinking funds, redemption, etc., may be contained therein, and, further, the auditor should see that these provisions are carried out. It might also be well to examine the county records for any other incumbrances on real estate appearing among the assets, although how far an auditor's duty extends in this direction is still an open question.

Contingent liabilities, such as endorsements on bills receivable discounted, should not be overlooked. They sometimes become direct and very live liabilities in short order.

(341) CAPITAL STOCK.

Examination of the books and records pertaining to the issuance of capital stock should, at least, extend to the checking of the Stock Ledger Trial Balance and inspection of the stock certificate stubs and preferably also the transfer records. This latter is, however, sometimes of such volume that it is necessary to have it made the subject of a special examination. As with the issuance of bonds, the minutes should be examined for any action relating to issuance, retirement, or exchange of capital stock.

The articles of co-partnership in private firms should be examined for the provisions relating to the investments to be made by the several partners, interest on capital, and on withdrawals, division of profits, etc.

(342) PROFIT AND LOSS ACCOUNT.

The audit of the accounts constituting the Profit and Loss Account is partially covered by the work incident to auditing the items of the Balance Sheet. It is in this part of an audit that the greatest amount of detail is

usually encountered. While this cannot always be said of financial institutions, the verification of those accounts constituting the Balance Sheet often requires a more extended examination of detail than the Profit and Loss section, yet of manufacturing, mercantile, and enterprises of like character, this is undoubtedly true.

(343) VOUCHERS.

Limited space only permits of some very general remarks in this connection. The entries in the Cash Book should be vouched; when the payments are all charged to Personal Accounts, or for such of them as are when this is only partially the case, paid cheques, may be accepted as sufficient vouchers, the invoices for purchases, etc., being examined and used to vouch the credits to the Personal Accounts. These latter usually come through a Purchase Book or voucher register, or, where the system is antiquated, are found in the Journal. Cheques which are drawn to "Bearer," "Cash," or to order of a bank, in such form that the funds could be obtained by the bearer either in cash, due bill, etc., should, of course, not be accepted as final vouchers. A cheque to the order of pay-roll is of no value as a voucher for wages payments, except in so far as it might imply that the drawer held himself responsible for the correctness of it; such a conclusion would, however, be rather far-fetched, as the person signing a cheque is not usually one upon whom the examination of the pay-roll would devolve.

In the case of very large concerns it is not practicable for the auditor to examine all the vouchers. The best plan is to have all payments charged to Personal Accounts, or a controlling account, such as "Vouchers Payable," and have all vouchers entered in a Voucher Register to the credit of Personal Accounts or the controlling account, the Cash Book and the Voucher Register, to be kept by separate persons. By this method the voucher for each payment, except such few as it may be desired to charge direct in the Cash Book, and which can be readily examined by the auditor, is submitted to the scrutiny of a second party, who has no connection with the Cash or Bank Account, and who, except in the event of collusion with the cashier, would have no interest in putting through any fictitious vouchers.

(344) PAY-ROLLS.

In connection with the subject of vouching payments, that of pay-rolls may be spoken of. It is generally conceded that, as regards pay-rolls, the only safety is in numbers, and this, of course, with a good system to make the best use of the numbers. An auditor may verify the footings and in some cases be able to check back the pay-roll to the original time reports from which it is made up, but to accept any further responsibility than this is foolish in the extreme. Even in the instances where it might be possible

to verify the pay-roll by other documents, the time required to do it would usually entail much greater expense than clients would care to pay.

The party making up the time should not be the same one who affixes the rate and makes the extensions, nor should either of these, where it is possible to avoid it, be concerned in the filling of the envelopes or the actual paying off. In some parts of the country, such as in the South, where thriftless negro labor is employed, the question of unclaimed wages becomes quite important. A good plan to take care of these is for them to be turned over to the treasurer, or some other authorized person, immediately upon completion of the paying off, to be entered by him in a book ruled to permit of the workman signing for his envelope when calling for it subsequently. After a sufficient lapse of time those still uncalled for should be returned to the general cash, being credited to an "Unclaimed Wages" Account. From the book before mentioned, the auditor can easily see that no unclaimed wages are lost to the company or proprietor.

(345) INCOME.

In practice the satisfactory auditing of the income will be found more difficult than that of the expenses. Here, too, a good system is the best assurance of the integrity of the accounts. The recording of the sales should not be committed to the charge of the same person who handles the cash collected. This will go far to insure the correctness of the sales record and obviate any intentional omissions. Where possible the auditor should verify the sales independently for at least a portion of the period under review. The circumstances of each particular situation must, of course, govern. If a Stock Account of the production is kept or can be constructed, as, for instance, at coal or ore mines, the sales can usually be verified, as to quantities at least, quite satisfactorily. In this connection the matter of "internal check," which is dwelt upon at length in most works on auditing, may be mentioned. Briefly stated, it consists largely in so disposing the office staff that there will in reality be an internal audit continually going on. In some cases this is arranged by changing the duties of the various clerks from time to time: *e. g.*, in a bank where there is more than one individual bookkeeper it is well to change the bookkeepers from one to another; where there is only one it is not always practicable to vary his duties, but the trial balances can occasionally be taken off by someone else, and the customers' pass books balanced or statements made out by someone other than the bookkeeper.

In other instances this is accomplished by having the work so divided that the work of one person is incomplete in itself, and must dovetail into that of another before being complete, the theory being that only by collusion between two or more parties would it be possible to conceal dishonesty. In still other instances the duties of one of the office force are those of an auditor, he verifying much of the detail which it would not be practicable for the professional auditor to go into.

Income from securities presents no especial difficulty, as that collectible on bonds and mortgages can be determined from the securities themselves, while the dividends declared on stocks can usually be quite easily ascertained.

Miscellaneous income must be dealt with as the occasion demands; there are hardly any two businesses in which the various items can be verified in exactly the same way.

Regarding the footings, postings, etc., to be verified, this will, of course, vary with circumstances. As a general rule, the footings of all the books of original entry and of the nominal ledger accounts should be verified. All postings to the impersonal accounts and, at least, the credit postings (particularly the cash) to all other accounts should be checked. It goes without saying that the Trial Balance and its footings, as well of subsidiary ledgers as of the General Ledger, should be verified.

(346) CASH RECEIPTS.

Whenever possible, it is very desirable that the entries on the cash received side of the cash book should be compared with remittance letters or other documents which will show that the proper amount has been accounted for. It is quite unusual, however, for the remittance letters to be obtained in such shape as to make a comparison possible, the principal reason being that a customer frequently, when remitting in payment of an invoice, places an additional order in the same letter, or makes some complaint or gives some instruction which necessitates the letter going to some other department for attention. This difficulty might, of course, be remedied by having a stenographer make copies of such portions of the letter as had to be referred to other departments, but in a large business the expense of following such a method would be too great to be seriously considered. It might also be urged that, with proper instructions being given, the letters could be returned from the departments to which they have been referred, and then filed in proper order for the auditor's attention. In actual business practice, however, these instructions are scarcely ever followed in a satisfactory manner and the results cannot be depended upon.

(347) THE AUDIT OF SINGLE ENTRY BOOKS.

The proof of the correctness of the work does not consist of equal debits and credits as in double entry, but in equal balances of Sales Book, Cash Book and Ledger. As the debit and credit entries from the Sales and Cash Books are posted to their respective columns in the ledger, it is self-evident that the difference between the debits and credits of these books will be equal to or agree with the difference between the debits and credits in the ledger, provided, of course, that none of the accounts in the ledger have been closed, a fact that must be carefully borne in mind. The next operation (the necessary check of sales and cash books against the ledger

having been obtained) would be that of tabulating the sales and purchases. This done, it should be an easy matter to make up the necessary accounts to complete the general ledger. Statements should be mailed to each debtor and called for from each creditor, the replies to be addressed to the auditor's office. The whole of the work having been carefully scrutinized, balances (as per statements) verified, and an analysis made as outlined any attempt at "juggling" would be speedily revealed and the whole of the auditor's work brought to a satisfactory termination.

(348) GENERAL AUDITING PROGRAM.

The following has been officially published as a general auditing program, to be used by accountants as a reference guide when arranging the plan of work to be done in auditing books of businesses of various kinds.

This program is very complete, and we have nothing to add except that it will not be found necessary to endeavor to carry out this program in its entirety, but it is formulated with a view to covering every possible eventuality.

PRELIMINARIES.

List of books used. Audit note-book and its use; printed (or written) instructions for auditors' clerks. Books and papers of business under audit; articles and minutes of stock company; general system of bookkeeping; manner of making payments; plan of checking; custom as to vouching, board of directors, account committee, etc.; treatment of items in cash book, bank pass book and vouchers; unusual payments or receipts; wages and petty cash payments; custom as to balancing and posting cash book; branch establishments, returns of work, accounts and expenses; treatment of day books, sales books, purchase books; invoices, as to quantities and prices; proving the journalizing; bill books, renewed or dishonored bills, securities if any; checking postings; transfers, through journal or otherwise; division of expenditures; capital stock register as to amounts received and postings, transfers, subscribed and paid-up capital, arrears; mortgages; debenture bonds, amounts to be verified; inventories or stock sheets; general stock account; prices on goods finished or in progress; custom as to verification of stock returns; wear and tear and depreciation; short leases; expenditure on capital account; new works, replacements; conveyance deeds and securities; balances and securities at bankers; cash, bills and other securities in hand.

OBJECT OF AUDIT AND METHODS OF PROCEDURE.

Fraud; technical errors; incorrect principles; mere agreement of balance sheet with the books not sufficient; examination of books necessary; limit as to detail; cash book; checking; private ledger; thorough knowledge of the uses and possible abuses of each book used; search for weak points; scrutiny of contracts and other documents. Continuous audit; advantages; possible dangers; special check or "tick." Completed audit; custody of

the books and vouchers; prompt completion of each branch of audit; checking ledger balances and addition of such balances at same sitting.

WORK PRECEDING TRIAL BALANCE.

Calling back postings; nature of transactions revealed; cash book; advantages of careful checking; uncertain or illegible figures; corrections; erasures; necessity of good light; clear enunciation of "caller." Checking additions; private ledger; cash book, petty cash book, bill books; wages book; amounts carried forward; columnar books.

LAST PRECEDING BALANCE SHEET.

Comparison with opening ledger balances; verification as to statement of assets and liabilities; close scrutiny of figures for plant, capital stock, etc.

VOUCHERS.

Receipts; entries in cash book; receipt book stubs; numbered receipts and stubs; two accounts paid together; need of fixed rule; irregularities in terms of credit; communication with client's customers; firms sending their own forms of receipts with payments; date agreement of cash book entries and receipts; cash sales; system of internal check.

PAYMENTS.

System of recording; checks; receipts; insurance premiums. Petty cash; inspection of vouchers, or certification by responsible person; restrictions on petty cashier.

WAGES.

Frequent source of fraud; difficulties; system of payment; safeguards; wages books added and checked one week against another.

BANK ACCOUNT.

Deposits checked with pass book and duplicate deposit slip noting items and names; reconcilement with cash book; bank balance and pass book personally verified by auditor; cash in hand; tickets or I. O. U.'s. Auditor's identification marks.

BILLS PAYABLE, ETC.

Bill books; paid notes and acceptances returned; ledger account. Bills receivable; treatment by auditor; matured or discounted bills traced to cash book and those dishonored to debit of customer; verification of bills in hand; deductions for discount; liability on bills under discount; the ledger account.

CONSIGNMENTS.

Checking; letter files, copy books, accounts current; exchange, if any.

TRIAL BALANCE.

Each department brought to a balance, if possible, at a single sitting; custody of books; use of distinctive ink for check marks.

BALANCING THE BOOKS.

Not usually a part of auditor's work; when requested, to secure balance, localizing an error; "tabulating" the ledgers; rechecking; completing audit without an extra balance.

STOCK COMPANIES.

Articles of association. Capital stock accounts; relation to amount issued to *bona fide* applicants, to articles and to minutes; cash book as to amount paid in; capital stock liable to forfeiture; shares ledger; debenture accounts. Dividend and interest accounts. List of stockholders checked with shares issued and dividends payable; verification of figures; vouching payments of dividends when checks are drawn on regular bank account; tracing outstanding dividends; registration of mortgages; examination of all company books. What the published accounts and accountant's report should show, and form of certificate.

METHODS OF KEEPING ACCOUNTS.

Propriety of accountant suggesting improvements; general system of internal check; general system of accounts; deposits in bank; payments by check; petty cash; verifying cash and bank balance; ledgers; trade ledgers; balancing trade ledgers; cost accounts; knowledge of business carried on; special materials; general materials; expenses of production; indirect expenses; columns in cash book to facilitate balancing the ledgers; separate cash book to each ledger clerk; treatment of invoices; treatment of discount and interest; rents; stock accounts; suspense accounts; bad and doubtful debts; use of journal; wages and salaries; preparation for audit.

In the text books attention is devoted to the subject of the attitude of the bookkeeper and auditor, one to another.

The proprietor of the business frequently taxes the diplomacy of the auditor by an attitude extremely difficult to meet in a satisfactory way. Some proprietors, for example, think it their business to continually interfere with the auditor by inquiring why certain things are being done, and when certain other things are to be done. The attitude of the accountant in cases of this kind should be, as far as possible, one to impress the client with the fact that he thoroughly understands his own business and can only satisfactorily perform his duties when allowed to perform them without interruption.

Another class of client is found where requests are made for the state-

ments of results obtained by the auditor to be framed in a certain manner desirable to the client.

When requests of this nature are made, the best plan is to comply with them as far as possible, so long as the result will not affect the proper presentation of the exact conditions in the case. It is scarcely necessary to observe that the public accountant should always recollect the responsibility of his profession, and absolutely decline to amend his figures in any way which would render them incorrect or misleading.

(349) ENGLISH METHOD OF AUDITING.

The following is an auditing program published by English accountants, which may be considered authentic and therefore should be both valuable and interesting:

THE ———— COMPANY, LIMITED.

INDEX TO AUDIT PAPERS.

31st December, 1907.

Scheme of Audit.
Audit Notes and Special Investigations.
Tabular Statement, showing turnover and percentage of gross profit.
Report on Assets and Liabilities.
Bank Certificate.
Reconciliation Statement.
Certificate verifying Inscribed Stocks.
Summary of Ownership. S. S. Stocks.
Schedule of Bills in hand examined.
Certificate as to Outstanding Liabilities.
Time Account.

Section 1.

SCHEME OF AUDIT.

For the Twelve Months ending 31st December, 1907.

Counter Cash Books—
Agreed with cash sale tissue books
Castings checked
Cancelled tissues inspected
(*a*) Daily totals checked to cash book
Receiving Cash Book—
Castings checked
Daily totals agreed with pass-book receipts
Postings checked into private ledger
Paying Cash Book—
Castings checked
Agreed with pass-book payments
Vouched
Postings checked into private ledger
Pass-book reconciliation agreed as per statement
Bankers' Certificate agreed

(*b*) January and February vouchers inspected to ascertain that all liabilities have been included

Petty Cash Book—
- Cash Receipts checked
- Payments vouched and analysis checked
- Castings checked
- Balance in hand paid in

Purchase Day Book—
- Agreed with Invoices
- Castings checked
- Postings checked into private ledger

Sales Day Book—
- Castings checked
- Departmental totals checked into private ledger

Credit Book—
- Castings checked
- Departmental totals checked into private ledger

Journal—

(*c*) Entries vouched
- Postings into sales ledger checked
- Postings bought checked
- Postings private checked
- Castings checked

Bought Ledgers—
- Summary checked
- Balances checked and agreed, as per report

Sales Ledgers—
- Summary checked
- Ledger balances checked and agreed
- Doubtful debts reserved against, as per report

Private Ledger—
- Castings checked
- Cash postings checked
- Journal postings checked
- Balances checked and agreed
- Certified branch accounts agreed with ledger accounts

Stock Sheets—
- Castings checked
- Extensions agreed
- Prices tested with invoices
- Certificate from manager, as per report

Travelers' Sheets—
- Additions checked
- Balances forward checked
- Remittances paid in

Wages Sheets—
- Additions checked
- Signed by workmen
- Counter-signed by cashier and manager

Register of Debentures—
- Inspected and balances agreed

Register of Mortgages—
- Inspected and agreed

Share Transfers—
- Checked into register of transfers
- Postings into share ledgers agreed
- Transfer fees agreed
- Cancelled certificates inspected

Share Ledgers—
- Postings from register of transfers agreed
- Balances taken out and agreed

Minute Book—
- Perused and abstract taken (see audit notes)

Investment Ledger—
- Postings checked
- Brokers' Notes, for investments bought and sold, inspected
- Securities inspected, as per report
- Income on investments agreed

Bill Books—
- Called into ledgers
- Castings checked
- Totals to private ledger
- Bills in hand inspected as per schedule
- Contingent liability on bills discounted

Agreements with manager, secretary and others, inspected
Contracts in course of completion
Forward contracts
Goods sold, on sale or return
Memorandum and Articles of Association inspected
Report

Section II.

AUDIT NOTES AND SPECIAL INVESTIGATIONS.

(*d*) Report on system of internal check
(*e*) Report on checking quantities in each department
(*f*) Special investigation on department A, which shows a reduction of ..... per cent. in the gross profits
Agree quantities, selling and buying prices, and report.

Section III.

TABULAR STATEMENT SHOWING TURNOVER AND PERCENTAGE OF GROSS PROFITS.

Section IV.

THE ———— COMPANY, LIMITED.

BALANCE SHEET—31st December, 1907.

	£	£
To Authorized Capital—		
To Subscribed Capital—	K	
Ordinary Shares of £10 each.....		
Preference Shares of £10 each.....		
To five per cent. mortgage debentures of £100 each	L	
To Sundry trade creditors	M	
To Reserve	N	
To Profit and loss account	O	
To Contingent liabilities		

		£	£
	By Goodwill, as at 1st January, 1907	A	
	By Freehold Premises at cost	B	
	By Leasehold Premises, as at	C	
	31st December, 1906 ..... £		
	Less sinking fund		
	annum, from the ....., 1906.		
	Cost of lease ..... £		
	Less sinking fund ..... £		
	Agreed writings-off with sinking fund table.		
"D"	Plant and Machinery Account—		
	Amount forward from last account, £		
	(*g*) Additions during the year, viz.:—		
	(*h*) Less depreciation written off, viz.....% on original		
"D"	Stock at Manager's valuation	H	
"D"	Insurances paid in advance	I	
"D"	Cash, Bills, etc.	J	
	Bankers		

Section V.

REPORT ON ASSETS AND LIABILITIES.

"A"	Goodwill			
	Original purchase price, as per last account			
"B"	Freehold Premises			
	Original purchase price			
	Inspected deeds and checked same with abstract of title			
"C"	Leasehold Premises			
	Inspected lease, granted by Mr. ..... to the Company for a period of ..... years, at a rental of £..... per			
"C"	Plant and Machinery Account, as at 31st December, 1906	D		
	Additions during the year			
	Less amount written off			
"C"	Office Furniture, as at 31st December, 1906.	E		
	Additions during the year			
	Less amount written off			
"C"	Sundry Trade Debtors	F		
	Less reserve for bad debts			
"C"	Investments @ cost	G		
	British government stocks			
	British railways			
	Foreign and colonial railways.....			
	Industrial			
"C"	Office Furniture—			
	Amount forward from last account, £			
	Additions during the year, viz.:—			
	(*i*) Less depreciation written off			
"C"	Sundry Trade Debtors—		£ *d* *s*	
	(*j*) Balances as per last account			
	Sales, as per summary of day books			
	Credits, and returns, as per credit books			
	Cash received, as per cash book			

Discount allowed .....
Journal entries, viz.:—
Bad debts written off .....
Contras agreed .....
Balances 31-12-'07, viz.:—
"A" Ledger .....
"B" Ledger .....
"C" Ledger, etc. .....
Balances as above ..... £
Less discount reserve .....
Less bad debt reserve .....
Inspected all sales ledger balances
All known bad debts written off
Discount reserve— per cent. on balances outstanding
Bad debt reserve— per cent. on balances outstanding
Average per cent. of bad debts on turnover
(*k*) Separate report on each ledger

"G" Investments—£ at cost, viz.:—
(*l*) £1,500 Consols @ 92⅛, Bank of England verification
Certificates produced in names of
, Directors, as Trustees, £ .
£1,000 L. & N. W. Deferred Ordinary Stock @ 130, £ .
Certificates Nos. 107-8 produced
£100 Mashonaland Railway Ordinary Stock, 72, £ .
Certificate 103 produced
£500 Baltimore & Ohio Railway Company, @ , £ .
Bonds produced, Nos. 19875-6-7-8 and 9
1-64th share of s.s. "————"
Summary of ownership obtained from Registrar of Shipping and agreed
Checked Stock Exchange valuation
Agreed income on investments

"H" Stock—
£ at Manager's valuation
"A" Department, £ ; "B" Department, £ ;
"C" Department, £ .
Additions checked
Extensions tested

The manager of each department annexed the following certificate to his stock sheet:—

"I hereby certify that the above stock has been taken at cost price, or its depreciated cost price, and that in no case has it been taken at higher than the current market price ruling at 31st December, 1907.

"I further certify that all obsolete stock has been written off."

(Signed)

Saw the manager of each department and discussed the pricing of the various stocks.

Numerous items in each department were compared with invoices and price lists, and were found to be lower than the current prices.

"I" Insurance Paid in Advance, £
Calculations checked, viz.:—
South British £5,000 stock, 12 months to 25th March, 1908, £ .
North British & Mercantile, £3,000 plant and machinery, June, 1908.

"J" Cash, Bills, etc.—
- Cash book balances agreed with bankers' certificate, as per reconciliation statement
- Cash (petty) paid in 31st December, 1907
- Cash in hands of travelers, paid in
- Bills receivable, inspected as per statement
  - Cash at Bankers ..... £
  - Bills Receivable ..... £

"K" Subscribed Capital—
- Ordinary
- Preference
- Agreed with shareholders' ledger, as per schedules

"L" Mortgage Debenture Bonds—
- Total as per last account
- Paid off
- Cancelled bonds seen
- Total as per balance sheet
- Agreed with register

"M" Sundry Trade Creditors—
- Bought Ledger "A"
- Bought Ledger "B"
- Balances, as per last account
- Goods as per bought day book
- Cash paid
- Discounts allowed
- Journal entries and contras
- Balances as above

"N" Reserve
- As per last account
- Additions as per resolution

First, there is a carefully prepared index of the whole of the papers, which are numbered consecutively, so that it is easy to tell whether any records are missing at the time.

Sect. I comprises a scheme of audit for the twelve months ended the 31st December, 1907, which I propose to go through as briefly as possible.

Sect. II deals with the audit notes and special investigations. and I wish you to clearly understand that, although I advocate a carefully prepared scheme of audit, revised and improved from time to time, I hold that, in addition, special investigations should be ordered by the principal in charge of the audit; an example of their nature is set out.

Sect. III is a tabular statement of departmental gross profits, and of their percentage on the turnover, and I cannot too strongly emphasize the importance of this statement, my own strong conviction being that no auditor should ever give a certificate until he has satisfied himself that the gross profit shown by each department is a reasonable one. In the event of any violent fluctuations in the percentage of gross profits, a searching investigation should be made, and should not be left until an explanation, satisfactory to the auditor, and proved by facts and figures, has been obtained.

Sects. IV and V. I have now arrived at the most important part of my paper, viz., the balance sheet, and the necessary records in relation thereto, and I would call your special attention to the letters marked against each asset and liability. This form of balance sheet is the ordinary form of a merchant's balance sheet, with letters clearly referring to the separate reports on each asset and liability, which I am about to put before you.

My records on this subject are quite simple. Before I will pass a balance sheet, I insist that a separate report on each asset and liability, lettered to correspond with the balance sheet, shall be made out and signed by the senior audit clerk, and, of course, carefully scrutinized by the principal in charge of the audit. Where more than one partner exists in a firm of accountants, I strongly recommend that a board meeting of the partners should be regularly held, at which the senior audit clerk should attend with his records and report. I am well aware that some of my conferees do not approve of the methodical treatment which I have put before you, because they consider that the audit clerks are apt to become too mechanical, but my contention is that my scheme of audit and other records are all necessary parts of an efficient unit, and nothing but good can result from each clerk assuming full responsibility by signing for the work accomplished. In addition, the principal, in consultation with the clerk in charge, should arrange for special investigations.

The following further comments were made by Mr. Pitt on certain of the items in the scheme of audit and investigations as indicated by the letters placed against them:

(*a*) I would emphasize this, that this work must always be done where the actual system of internal audit does not provide a check upon the cash sales. In practice, of course, where you have a large number of tissue books, this is always a part of the internal audit and not the external.

(*b*) This item I attach considerable importance to. My own opinion is that an accountant should never take the word of the bookkeepers that the liabilities have all been included, but should do a great deal more; he should obtain a certificate from the man in charge of the books to that effect, and should inspect all payments subsequent to the date of his audit to see that all liabilities have been properly included. I always make this last item a definite part of my scheme which can never be omitted.

(*c*) This is a very important matter. It is not sufficient, in my opinion, for an auditor mechanically to check the entries which he finds in a journal. He should most carefully verify every entry, and get the original documents to see that those entries are justified.

(*d*) Unless we know all about the system of internal audit we can hardly devise a proper scheme of external check.

(*e*) This is a very important matter, too. Where it is possible to check quantities as well as money amounts, it is of the utmost importance that it should be done.

(*f*) This is an investigation that is always necessary where there is a considerable reduction in the percentage of gross profits.

(*g*) I always insist that every addition to a fixed asset should be clearly stated; its nature and full particulars.

(*h*) I emphasize the words "original cost"—not its depreciated cost. It is exceedingly necessary that this amount of depreciation should be large. You cannot write down your fixed assets too heavily. All those gentlemen who have had liquidation work, know what these things realize under a forced liquidation, and the ambition of all accountants should be to cut down the fixed assets as much as possible.

(*i*) Office furniture in insurance companies is written off altogether. Well, I will not go to that extent, perhaps, but at the same time I do consider it should be written down very heavily indeed, because it is not very far removed from a fictitious asset, its realizable value being so extremely small.

(*j*) I dare say during my scheme of audit you noted the extremely small amount of work apparently done upon the sundry trade debtors. No cash was called over; debits were not called over; neither were credits called over. Well, you will notice the castings in the minor books were all checked. My system is briefly this, that I have an absolute summary of the various ledgers, and these summaries are thoroughly and efficiently checked, and then the balances are gone through equally thoroughly.

(*k*) I go a little further than this in many firms. I like to delay my audits as far from the actual date of the balance sheet as one reasonably can, for this reason, that I am able then to prove in many firms absolutely every debtor balance. At the present time I have clerks auditing certain brokers' accounts, and they have instructions to pass no ledger account unless they can find that since the date of the balance sheet the actual cash has been received, writing off the balance. In many firms in London that is quite possible. However, in all firms, the cash received since the date of the audit is strong evidence as to whether the book debt is good or not.

(*l*) I have down here a list of the investments and their prices—their valuation as per the Stock Exchange list at the date of the balance sheet. The certificate from the Bank of England for inscribed stock are all inspected, and for one-sixty-fourth share of s. s. "———," a summary of ownership has been obtained from the Registrar of Shipping and agreed. The Stock Exchange valuations have been checked, the income on investments agreed, and finally the contingent liability on investments has been stated.

(350) DETECTION OF FRAUD.

This article represents the regular routine prescribed by the principal Chartered Accountants of Great Britain.

The auditor's duties will include the following, viz.:

1. To verify the accuracy of the balances at commencement of audit.

2. Verify cash receipts and cash payments by an examination of receipt books and by a thorough system of vouching.

3. Check all additions in cash book, sales and purchase day books, wages books, petty cash books, and ledgers.

4. If the ledgers are self-balancing, prove the accuracy of postings to these ledgers; if not the cash received on account of sales should be checked to cash book from ledgers, and some of the sales postings verified.

5. Returns, allowances, and discounts, should be inquired into if they are of a special nature.

6. All bad and doubtful debts should be gone through with principals before being written off or provided for.

7. Bank transactions should be verified with pass book and the bank balance agreed, special attention being given to the dates when payments are made to the bank and the details of such payments should be examined, as stated previously, in order to satisfy himself that all checks paid in have been debited to cash. It is not sufficient to simply verify the bank pass book balance with the ledger account balance.

8. If large sums of money are kept as cash in hand, attention should be drawn to the fact.

9. It is necessary for the auditor to satisfy himself that all items in the balance sheet are fully and accurately stated, so far as it is possible, and that sufficient depreciation has been written off. Reserves for all outstanding liabilities should be made and properly brought into account.

10. The cash in hand should be checked at unexpected visits and the securities and documents of title of assets should be examined.

11. He should ascertain that there are no charges on the property other than those stated in the balance sheet. In cases of limited companies' accounts, the register of mortgages and charges should be inspected, as well as the minute book of shareholders and directors.

12. The stock-in-trade and work-in-progress should be examined by the auditor as far as the additions and extensions are concerned, and he should have the same properly certified by responsible officials as taken at not more than cost, or market price if below cost.

13. Invoices for all purchases should be examined, and all revenue and capital expenditure properly apportioned.

14. The petty cash payments should not escape attention; cash sales, which may have been passed through petty cash book, receiving special notice.

15. All unusual sources of income and extraordinary expenditure must be carefully inquired into and properly vouched.

The auditor will find it useful in balancing the accounts if he makes a note of every error which he finds in the accounts, and the effect which it will have in the final balancing of the figures. Any alterations in the books should receive some significant checkmark so that if any figure is altered after his visit he would be in a position to more easily detect it; erasures

should not be made, and if any alterations of figures are necessary, the original figures should be crossed out neatly and corrected figures placed above the original ones. If the audit is a continuous one, the risk of alteration of figures is very much greater, but if the auditor can possibly complete any definite portion of the audit, say the additions of cash books, sales books, and make a note of totals, this risk will, to some extent, be minimized. The abstraction of a list of ledger balances, as the audit is proceeded with, the additions of each side of the account being checked, is useful in detecting alterations made after the audit of these figures has been completed. The verification of the accounts receivable is a difficult matter unless the auditor is allowed to send out statements asking the debtors, in case of error in their accounts, to communicate with him.

(351) USEFUL AUDITING DEVICE.

In many large business houses it is now the custom to send out at regular intervals a notice similar to that appended, the object being to compare the ledger balances with those appearing on the books of customers. It will be noted that a special stamped envelope is enclosed for the reply, which is usually directed to the business address of the accountant who has the audit in charge.

Your debit balance on the books of this Company ....., 19.., is $.....
Kindly compare this with your books and state below whether it *agrees* or *not*. If any difference should exist please state amount of difference and if possible the items making same.

This is sent *not as a dun*, but for the purpose of enabling us to verify our accounts and check up our books correctly. Please reply on form below and return this sheet in stamped envelope enclosed.

Your credits since above date are as follows:

Gentlemen:

Balance as shown above, ..., is ..... correct.

....., 19..

Signed .....

(352) HOW TO BEGIN AN AUDIT.

The pointers given hereunder are suggested by one of the best accountants in the world, Mr. George Wilkinson, C. P. A., member of the American Association of Public Accountants and the originator of the Certified Public Accountants' Law, which has been enacted in so many States.

The following quotation from Mr. Wilkinson's address to the New York University School of Commerce, Accounts and Finance, in 1907, is as good now as it was then:

(353) HOW TO BEGIN A COMPLETE AUDIT.

Your firm has been engaged, we will say, by the directors of a certain company to make a thorough audit of the business. No specified instructions have been received and nothing is fixed except the daily rate of

remuneration. While it is essential to be thorough, it is equally important that no unnecessary work should be done, to the end that the charge may be reasonable.

Before counting the cash, ascertain what time in the morning the office is open and be on hand to count the cash the first thing. Let the cashier himself handle the money, while you see it done and note down what the drawer contains. Treat the cashier with as much respect as if he were the proprietor; concede his point of view. Take him at his own estimate meanwhile, and don't be in too much of a hurry to find something wrong. If the cash does not quite agree with the balance called for by the cash book, make a note of the factors used and then ask the cashier to determine the difference and let you know.

Now, in counting the cash on hand in a commercial business or manufactory, in fact in any office except a bank or trust company, count the actual money first and make a memorandum; then take the tickets, vouchers or other evidence of payments, adding information in regard to them to your memorandum. When this is done see that the cash drawer does not contain any more money. There might be an envelope containing some money that was "over" on previous occasions.

Whatever conditions you find in the cash drawer, accept them as they are, in the first place, and take steps to better them afterwards. Don't give the cashier a lecture on how to do his work, right off, but reserve your advice until you are better acquainted with the case. Of course, if the cash is not right, you must report the fact promptly to your employer, or, if he is not available, you should report at once to your client.

When the count of the cash is complete put your own footings in the cash book in red ink and write in the words "Auditor's Footings," stating the date and signing your initials. The next thing to do is to verify the cash book additions from the first day of the current month.

Next comes the bank account or bank accounts. In a regular audit, where your firm has made the audit annually for some years, it will suffice if you verify the cashier's last reconcilement with the bank. In new audits, especially if there seems to be room for any doubt, it will be your duty to send the bank pass book to the bank and have it balanced especially for your audit. When the pass book comes back have it delivered to you with the paid checks and proceed at once to make your own reconcilement, independently of the cashier.

But the pass book will not be ready for a day or two, so in the meantime you can take up the next matter. In a small business, where the cashier keeps the books, it will be well to examine all the paid checks, comparing the names and amounts with the stubs and scrutinizing the endorsements. It will also be necessary to compare the entries in the cash book with the check book. This work can well be done, or, at any rate, begun on the first day. In a larger office, where the bookkeeper has nothing to do with the cash, it will not be necessary to compare all the paid

checks. A portion of the period, if tested thoroughly, will be enough. In a large office it will be impossible to examine the paid checks on the first day.

All canceled checks should be accounted for. They should either be filed with the paid checks or preferably that portion of the canceled check which bears the printed number should be pinned or pasted to the stub. See that all canceled checks have been so treated. Then turn to the end of the check book and see if any checks have been taken out and not accounted for.

The next thing to do after counting the cash on hand and verifying the current month's additions in the cash book, and checking the bank reconcilement, is to call for the bills receivable. At the same time ask for a list of these. If a list is not to be had you can make your own. Examine all the notes carefully; include on your list the names of the makers, the due dates and any other pertinent information. If any notes are secured, state in what manner.

It is well to tackle the vouchers as soon as you can, because you learn a great deal about the business you are auditing by scrutinizing these. In a large office it will be impossible to examine all the vouchers on the first day, possibly not any; but it is very desirable to get next to the vouchers at once. Have them brought out; see what shape they are in; map out the work you intend to do on them, but do not neglect other more pressing matters to audit the vouchers on the first day.

In the absence of a voucher system, receipted bills may be offered as evidences of payment. In a small office it is well to make the examination of these part of the first day's work.

Ask the bookkeeper for the latest trial balance, and look at the end of the recapitulation to see if it does balance. If it doesn't balance, look at the previous one, and ask the bookkeeper what he has done to find the discrepancy. Take a look through the general ledger, scanning the accounts and making a memorandum of the pages and names of the accounts you will analyze, such as merchandise, manufacturing, expense, interest and discount, and the like. In looking hastily over the trial balance see what controlling accounts there are which call for subsidiary trial balances, such as "Customers' Ledger," "Sundry Creditors." Ask for the subsidiary trial balances for these and look at once to see if they agree with the controlling accounts in the general ledger.

(354) HOW TO BEGIN A LIMITED AUDIT.

The procedure in this case is radically different. Your client is not the proprietor and has a certain definite purpose to accomplish. He wants to know the condition of the concern and the net earnings derived from the business; he also wants to know that the truth is told in the books of account—the official history of the business. The counting of the cash; the verification of the bank accounts; the checking of the vouchers can all be dispensed with in favor of doing something that will lead at once toward the end sought.

If your letter of introduction is addressed to the president of the company, he will turn you over to the secretary with instructions that the latter shall afford you every facility. The first question the secretary will ask you is, "Well, sir, where do you want to begin?" The first thing I would ask for is a place to work and then the general ledger, journal and trial balance book. Turn at once to the last recorded trial balance—look at the end of the recapitulation to see if it balances—and begin immediately to dig into the principal impersonal accounts. Take a preliminary look through the general ledger, noting the work you have to do and the further information you need. Make an exact copy of the profit and loss account as it appears in the ledger. This is to serve in the first link in the chain of identification between the books and your report. As your copy of profit and loss account grows, fill in, on your sheet, all the particulars you learn from the journal entries. As you do this, you should make a memorandum of the folios and names of accounts you intend to analyze or from which you must draw further information. On another paper, make a list of things you want to get from the secretary of the company or from the bookkeeper.

Long before noon you will have finished your copy of profit and loss account and will have two sheets of paper running somewhat like this:

WORK TO BE DONE.

1. Make an analysis of merchandise account p. 8.
2. Period to be covered—last three years ending 31st October.
3. Make an analysis of general expense account p. 67.
4. Make an analysis of salaries account p. 73, showing separately officers, salesmen, bookkeepers, clerks, etc.
5. Verify the sales from the books of original entry and make a schedule of monthly totals.
6. Analyze "Interest and Discount" account p. 84, showing separately (*a*) Interest on borrowed money; (*b*) Cash Discounts; (*c*) Dividends received on investments.
7. Look up the minutes of directors' meetings in respect of dividends declared and the authority for increasing president's salary.
8. In verifying Customer's Ledger trial balance, make a schedule of delinquent accounts—and so on.

The other list will read on this order:

INFORMATION WANTED.

1. Annual Inventories on 31st October, 1904, 1905 and 1906.
2. Schedule of Bills Payable outstanding on 31st October, 1906.
3. List of shareholders at present time with their addresses and number of shares held by each.
4. Particulars of mortgages, stating due date, number of bonds, trustee, rate of interest.
5. Schedule of insurance policies in force, stating annual premiums and dates expiring.
6. Why were the books closed on 30th November, 1904, instead of 31st October?—and so on.

When the secretary comes to ask you if there is anything you will need during the next hour, because he is going out to lunch, you can hand him your second list and continue on another sheet.

In conducting a limited audit always make a start by digging right into the vital part of the records, postponing all checking and verifying until later. By doing so you will give the impression that you know what you want and where to get it. This will help you throughout your work and earn for you the co-operation of your client and his employes.

(355) HOW TO BEGIN A BANK AUDIT.

The first day's work in auditing a commercial bank presents some peculiar features and needs very close application and watchfulness. In the first place, the work should begin in the evening and not in the morning. As said earlier on, it is most desirable to begin well, to impress the officers and employes of a bank with the idea that you know your business. The auditor should therefore study carefully what he is going to do on the first day, arrange the work so that each member of his staff knows just exactly what to do, and how to go about it.

The executive officer of a bank is generally the cashier; to him you must address yourself immediately upon your arrival. In order to make a good start, in auditing a medium-sized bank, it is well for the auditor to arrive at the banking house with three or four assistants, at a little before the close of business, the day of the audit. You will remember that the books of a bank are balanced every day and you can drop in any evening and begin an audit. Request the cashier to instruct the general bookkeeper and the tellers to remain at their posts until the cash count has been completed, and the total agreed with the ledger balance.

Ask the cashier to designate a member of the bank's regular staff, one who is accustomed to handle money and yet is independent of the tellers, to help you count the reserve cash in the vault. An officer of the bank should be present all the time the cash in the vault is being counted. Secure from the cashier the names and designations of each of the employes who handles money.

Ordinarily the cash will be found in the hands of:

(1) The cashier, or possibly the assistant cashier, who will have charge of the cash reserve, which may largely consist of gold certificates.

(2) The paying teller will have most of his cash with him in his cage, but he may have some cash in the vault.

(3) The receiving tellers will have the currency that they have taken in during the day, and such checks as they have not turned over to the other employes of the bank. The bulk of checks and drafts, received from depositors during the day, will have been turned over to the clearing house clerks. These are called " clearings."

The principal in charge of the audit, or one of his senior assistants, will go at once to the cashier or assistant cashier (whoever keeps the

reserve cash) and will count this cash, making a memorandum of all particulars. If this reserve cash cannot be counted at once, it must immediately be sealed up until it can be counted.

The principal (or preferably the accountant most skilled in counting money) will go at once to the paying teller's desk and will count the cash in his hands, directly the teller is ready. He will also count the cash held by the paying teller in the safe (if any). He will make a memoranum of particulars. Give the teller time to make his own regular evening balance of his money.

If it should be found that it is quite impossible to complete the count of all the cash on the first day, some of the large unbroken packages of money may be put away until the next day in a safe, but must be sealed up by the principal. It is, however, far better to count all the money on the first night, however late it keeps you.

The auditor's first assistant will go at once to the first receiving teller's desk and will count the cash in his hands as soon as this teller is ready, taking full particulars. The receiving teller's balance must agree with his tally sheet.

In counting the cash, count the real cash first, leaving the checks and "cash items" (tickets, etc.) to be examined and listed afterwards. After all the actual cash has been counted examine very carefully all checks, tickets, due bills and other substitutes for cash (called "cash items"). Make a careful list of these "cash items," stating full particulars, dates, names, etc., and if O. K.'d, by whom; if not O. K.'d, say so. In counting the cash, take care that the teller does not handle any of the money after you have counted it, until you are all through. In order to prevent this, place the cash that has been counted beyond you and out of reach of the teller. Do this diplomatically, so that it will not give offence. It would do just as well, if the teller prefers it, to have all the money emptied out of the drawer onto the desk, and then count it back into the drawer, or into the teller's cash box. Do not allow a teller to pass any money out of his cage to any employe outside. In like manner do not permit the teller to receive any money from anyone outside of his cage, except (in case of necessity) from the cashier of the bank. See to it that the teller does not absent himself on any pretext whatever, while his cash is being counted, and that he keeps his attention on the matter in hand. Do not let him leave you alone with his money.

In counting the cash, you may accept (temporarily) sealed packages of notes and of coin for the amounts that the labels or outside markings call for. Set these aside to be taken up for closer examination, after the count of the cash has been made, but before leaving the teller's cage.

In the East you will find the cash on hand to be most largely paper currency; but in the Western States you will find large quantities of gold and silver. This is generally done up in large bags and labeled. Where the bills are of large denominations ($5 or more) they must all be counted.

Packages of smaller denominations should be tested, but need not all be counted. Money packages bearing unbroken the seal of another bank (where the teller has never counted the money) may be accepted at their face (indorsed) value, but it is well to watch the dates these packages bear. Count the loose notes and gold yourself, but you may allow the teller to count the loose silver coin, and stack it in piles before you; in this case, content yourself by counting one stack and comparing all others of like denomination with that one.

Use the scales so far as practicable to save the actual counting of coin, especially in reserve cash, and in handling bags containing large quantities of silver and gold. If there should be several bags of gold or silver coin, labeled to contain the same amount each, weigh them against each other and count only one bag, for which you should choose the bag that weighs the lightest. Fractional gold and silver weigh lighter than large coins; for instance, a bag containing $5,000 in double eagles will weigh a good deal more than the same amount in fives and tens.

All bags of money must be opened, so as to see that they really do contain money and not lead. Bags of money bearing the unbroken names and seals of other banks, may be accepted at their marked value, but watch to see that the value is reasonable and that the seals have not been broken. The practice of allowing sealed bags of coin to circulate between banks, without being opened, does not obtain in the Western States.

Make a classified summary of the cash count, including everything that enters into the cash account. The total of the cash, in all the bank put together, must equal the balance of "Cash Account" on the general ledger, the amount of which will be supplied by the bookkeeper. The proof of this must be arrived at the first night.

Checks on other banks that are of current date are listed by the clerks of the bank at the close of the day and are known as "clearings." Checks on other banks, that are found in the hands of the tellers must be listed, showing the date, the names of the drawers and indorsers, the banks drawn on and amount, also why they were not put through.

A printed form of verification should be sent to each clearing house bank, with the "clearings" in the envelopes regularly used by the bank. The auditor will seal up each envelope with his own seal and will take a list of the total amounts of the day's "clearings" (thus sealed up), stating name and clearing house number of each bank and the total amount in each envelope. There is no necessity to go into the particulars of what these envelopes contain. The circular letter inclosed with the "clearings" will serve as an acknowledgment from each bank, as it will come back the next morning, stating that the contents of the envelope were entirely correct and have been accepted by them in full for the amount named in the letter.

The principal will place his seal upon the boxes, wallets or other receptacles containing (*a*) discounted bills; (*b*) securities owned by the bank; (*c*) collateral held by the bank on loans. These will remain under

this seal until the second day, when they can be examined and listed at leisure.

All the work described above should be done on the first night, say between three P. M. and midnight.

Certain other work of great importance must be done the first day of auditing a bank. The general ledger must be balanced; the balances on the depositors' ledgers should be drawn off and the total agreed with the controlling accounts in the general ledger. Statements should be sent to banks having deposits; letters should be written to depository banks requesting special statements up to date and notices should be mailed to every bank throughout the country to whom drafts and checks have been sent for collection and on which no returns have been made.

(356) THE BANK AUDITOR.

With the growth and development of the modern bank, the demand among the larger banks for a more systematic continuous audit has resulted in the appointment, in most cases, of the Bank Auditor, an employe, and generally an officer of the bank. Although in nearly every instance, junior to the cashier, he is acting in the interests of the directors and in the last count of the shareholders, so that although he must, so far as possible, conform to the wishes of those senior to him, he must not accept advice or act under instructions which will prevent him from doing his full duty to those whose servant he really is. He must be free to do his work in such a way that he can feel that every safeguard and precaution has been taken to prevent his work from being futile or his efforts to prevent or discover fraud of no effect.

In his daily work he will come into contact, more or less often, with every department of the bank, and he will, therefore, be in a position to point out mistakes and suggest remedies, as well as improvements in the system in vogue, so that he requires to be a thorough banker, an accountant and a systematizer. All suggestions regarding improvement to the different systems should come from him and none should be made without his approval. To him all complaints and errors should be referred, and he will make explanations and correct mistakes, using what means he thinks desirable to prevent a repetition.

These traits, necessary in a successful Auditor of any corporation or in a Public Accountant, are quite as desirable in one holding such a position with a bank, and sufficiently well known as not to need enumerating. The following quotation from "The Modern Trust Co." is equally applicable to the banking business:

"No matter how perfect the system upon which the business of a trust company is conducted, its practical application is in the hands of officers and employes who are only human and therefore liable to make mistakes. Some may become unprogressive in their methods, while others may be too eager to introduce changes, which, though attractive from the standpoint

of one department, do not properly fit into the general plans of the company. It therefore becomes necessary to lodge in some one person or group of persons the authority to maintain and supervise the accounts and records of the company.

"In a small company the work may be done by the general officers, with the assistance of the general ledger bookkeeper. In a large company the general officers are properly relieved of such duties. Another officer, known as the controller or sometimes as the auditor, is engaged. This officer becomes the final link in the bookkeeping chain, and his authority should extend to all departments of the company. Changes in accounting methods that are at all radical should be submitted by him to the general officers, and, in some cases, action by the board of directors is advisable. Continuity of policy and uniformity of records are prime requisites in the permanent success of any business, and while a trust company should always be progressive and ready to adopt genuine improvements, it should not be continually making changes that are of uncertain value. When once a satisfactory system is installed, it should be maintained reasonably intact. If it is based upon proper principles, further improvements will be in the nature of a development rather than an alteration, and as such may be readily introduced.

"It is a part of the controller's duty to see that the system adopted is faithfully carried out in all departments, and by every employe. At the same time he should be constantly on the alert to detect weaknesses and to discover the means of saving labor and securing more accurate records. To do this, a man must possess a good knowledge of accounts and considerable force of character, coupled with a large degree of tact. He should be appointed by the board of directors and be directly responsible to the president for the proper discharge of his duties. No changes in the accounting system should be made by any clerk without the approval of the controller, and only the president and board should have the right to direct that changes be made contrary to his judgment.

"The controller should prepare, or at least approve, all reports or statements issued to the public or compiled for the use of officers and directors. He should verify the settlements of depositors' accounts and the statements rendered to beneficiaries by the trust department. He should examine and initial all entries for the receipt and delivery of securities owned by the company or held by the trust department, and he should be authorized to make at frequent intervals, but without previous announcement, examinations of all the departments of the company. In these examinations he should rely mainly upon comprehensive tests which he can make without attempting to verify each item. It should also be a part of his duty to approve, before payment, all vouchers for expenses, repairs, etc., whether for the company's account or for the accounts held in the trust department.

"The controller's work, if done efficiently, will serve as an internal

check upon the work of the office, and go far to detect and correct clerical errors which, if allowed to pass unnoticed, detract from the reputation of a company and at times prove a cause of serious financial loss. In addition to this, his constant oversight and firm grasp of the details of the company's business will, in most cases, restrain an officer or an employe from taking the first false step to disgrace and ruin."

(357) GENERAL DUTIES.

The work of a Bank Auditor embraces a continuous audit of the books of the bank, and this should include a verification at frequent intervals of all the assets, as well as the liabilities of the bank. The checking of cash books and journals, calling back of entries to ledgers and other books, is not usually attempted, as requiring too much work without compensating returns and also because more satisfactory results are obtained in other ways. The following accounts are best proved by a physical examination of the securities themselves: Home Bills, Foreign Bills, Demand Loans, Stocks, Bonds and Mortgages, and Cash; Transit Account, by checking payment against items charged as they come in, until the balance is wiped out; Due from Banks, by the checking of items on their statement with items on the accounts in the ledger; reconciling balances and reporting exceptions.

Balances due to banks will be proved by obtaining from each bank a reconcilement monthly of the accounts rendered them. Such accounts as Certificates of Deposit, Certified Checks, etc., will be proved by marking off of paid items, when total of those unpaid should agree with controlling account. Individual accounts are proved by statements being written up by independent clerks and balance compared daily, also by special reconcilements of account yearly. Practically all other accounts appearing on the Daily Statements are best proved by the entries themselves, which is not as big an undertaking as would, at first, appear. All computations of interest should be checked by the Auditor, as well as all entries relating to profits or expenses, with the possible exception of exchange.

Besides the foregoing, a very necessary duty is the verification of securities held as collateral and for safe-keeping. In some banks the auditor is required to make a report yearly or half yearly on all advances, stating in his opinion what he considers "Good and desirable business," "Safe but not desirable," "Liable to be a loss eventually, but which for certain reasons should be carried along and reduced as opportunity presents itself," "Liable to be a loss and payment of which should be insisted upon at once or charged to Overdue Debts."

The supervision of the accounting methods would also appear to be strictly one of the duties of the Auditor, as no one is more vitally interested in having the best and safest systems used, and also because he is in many instances able to so systematize the books and records, that without extra work one department acts as a check on another. There will also be errors

and complaints regarding accounts, items not advised, etc., which properly come under the Auditor's care.

(358) REPORTS.

A general report should be made by the Auditor, at least once a year, to the directors, showing Balance Sheet on the last day of the fiscal year and a copy of the Profit and Loss Account for the year. The correctness of these two statements should be verified and the Auditor should state briefly how the different items on the Balance Sheet had been verified.

(359) AUDITING TRANSIT ACCOUNT, ETC.

One method of auditing this class of accounts would be to take down a complete list of outstanding items, or totals of each letter where there was more than one item, giving date sent, bank sent to and amount, which list should agree with the amount called for by the General Ledger. From this list, write letters to every bank on the list, asking them to verify date and amount of letter sent them. Upon return of letters properly verified, check same off against list. Several letters would probably have to be written to some before obtaining verifications, but the percentage eventually not replying would be less than 1 per cent., if any.

Another method is to run off a list as formerly described, but to verify these charges by marking them off as the actual payments are made, care being taken to see that dates, names and amounts agree in every instance.

(360) DAILY AUDIT.

To obviate a great deal of unnecessary work, it is possible to start an audit as soon as all credits for the day have gone through and before the day's charges have been made. In this respect, the procedure would differ somewhat from an audit started at the end of the day and there would be some matters to guard against. It would first be necessary to see just what credits had gone through, and to see that no credits were "faked" through. By making a note of credits as appearing in the regular book recording such credits and also comparing these with Note Teller's entries and the credits themselves, deducting them from yesterday's balance as appearing in the Daily Statement, you would be pretty sure that the balance had not been tampered with.

A good plan is to open a new account for the day's charges, all credits in payments of items charged previous to the day of audit, being credited to the old account. The auditor is thus enabled to run off items remaining unpaid daily, thus proving that all payments have been referred to him. Whatever method is adopted, a complete list of outstanding items should be made, unless loose-leaf records are used, when they can be taken over by the auditing department, who would in that case mark off the payments and put through the entries.

(361) AUDITING COUNTRY BANK LEDGERS.

In the first place, the Country Ledger Keeper's figures, both debits and credits, must agree with the figures turned in by the different tellers, and the aggregate of balances with the balance of the controlling account on the General Ledger. Then statements of all the accounts on these ledgers are written up by clerks in the auditing department from the items themselves, balances compared and correcting entries made where necessary. Finally, at the end of each month, a list of the banks and balances is made out, added up and compared with the controlling account. Reconcilements are sent by the Auditor to each bank, and when returned the exceptions are checked off if since accounted for, and if not, inquiries are made, with the idea of adjusting all differences.

(362) CLEARING HOUSE ITEMS.

An easy method of auditing Clearing House Items is to make a special deposit at the early clearings to each bank of all items included in the clearings of the previous day, enclosing to each bank a special form for verification of amount deposited without change, and if any change, the amount and description of item. Checks should be looked over, but listings and additions can be accepted as correct, as the bank receiving deposit will notify Auditor of any errors. Deposits should be enclosed in envelope and sealed privately.

(363) SAVINGS ACCOUNTS.

The method usually suggested is the calling in of all pass books and comparing them with the accounts in the ledgers. This is certainly the best way, if practicable, though the time and work required to do it in a bank with many accounts would be considerable. Probably the same effect could be had by calling in a certain small proportion at every audit, eventually all accounts being covered. It would be as well to let the bookkeepers know that books were called in, but not to give them any idea how many or how few in number, sending out your own notices and keeping your own records of calls.

A good time to make an audit of this department would be the first few days after an interest period, at which time the majority of depositors bring in their pass book to have interest added. One or two clerks from the Auditing Department could enter up interest and compare balances and a lot of accounts could be covered in a few days.

Another method would be to send out verifications of accounts for signature and return, the precautions, as mentioned above, also being taken. Needless to say, whatever way was adopted, all ledgers should be proved by running off the balances.

(364) GENERAL ACCOUNTS.

Have all vouchers filed alphabetically, a file for credits and another for debits; then when an account is to be audited, debits and credits are run off on the adding machine, and the new balance worked out. It is necessary, of course, for the Auditor to keep an independent record of balances, and to make comparisons with both ledger and balance sheet. After proving account, vouchers should be carefully scrutinized and then cancelled.

(365) VERIFYING SECURITIES.

There are several different ways of verifying securities held as collateral to advances: One is to check the securities against the bills themselves, another against the record, as shown on the liability ledger or the securities register, where one is kept, while still another way is to make a record of what is called for from the notes themselves and check to this list. A Chicago bank keeps a complete record of all advances against securities, showing what the collateral is, the market price, market value, and amount of advance, on cards, one or more cards being used for each person. The market price and market value are both entered in lead pencil, so as to be easily altered and thus kept in agreement with current quotations. These cards are easily balanced with the Collateral Home Bills and partly on this account, and also on account of being so complete and handy a record, they are ideal as a means of verifying collateral securities. Securities held for safe keeping should be compared with the register where they are recorded and a letter written to each person, requesting a verification of the list as given in the letter.

Lists of all bonds and other securities, totals of which agree with the respective controlling accounts on the General Ledger will have been made out and the securities called for by these lists must be produced. Once having commenced a verification of securities, the Auditor should see that they are all under his control and that none are added to or taken away without first being inspected and such change approved by him. Should it not be possible to have all securities under his control, such others should be locked up and sealed by the Auditor until he has time to examine same.

(366) OTHER BANKS.

Accounts with other banks are usually those with whom all or the majority of transactions arise with the bank owed or the credit bank. In such cases it is the custom of the bank with whom the other bank keeps an account to render a statement, and in that event, it is the duty of the bank receiving statement to check off the debits on the statement with the corresponding credits on the ledger and the credits on statement with corresponding debits on ledger. Should it ever happen that all entries in both statements and ledger account checked off, balances would agree, but as this is impossible of occur-

rence in an active account, it is necessary to gather these unchecked items together to see if when they are eventually accounted for, the balances would then agree. In other words, it is necessary to reconcile the account. Reconciling accounts received and seeing that the accounts rendered are reconciled, are two duties of the Auditor, which require a considerable amount of time and the greatest accuracy. Accounts kept with other banks are, therefore, reconciled, all exceptions being accounted for satisfactorily, and all balances, as proved by reconciling the accounts listed, and the aggregate compared with controlling account in General Ledger.

(367) THE VALUE OF AN AUDIT.

The value of a commercial or general business audit depends upon its purpose, its minuteness of detail, the authority and responsibility of the auditor and the scope of his instructions. The duties of an English chartered accountant, acting as an auditor are defined, and, to a certain extent, specified by the "Companies Act" of 1862, which compels an annual audit of all registered joint-stock companies. The United States law has a similar provision, compelling the examination of all national banks by qualified government examiners. But so far as other corporations or private enterprise are concerned, an auditor's duty consists in performing that for which he is employed, and he is responsible to his employer only. If his appointment depends upon the good will of the company's officials, the presumption is that he will act as their agent rather than as the agent of the stockholders; or, if he be engaged to examine accounts and report upon some particular question, it is not likely that he will take it upon himself to extend his examination and report to cover more than that question. For instance, if he is asked to ascertain whether a reported reserve fund is real, or exists upon paper only, and how the said fund is invested, or to say whether, in his opinion, the working capital is sufficient, he would discharge his duty by a partial examination of the accounts and a report upon the one question submitted to him. But when a complete audit of the accounts of a mining company is required for the purpose of presenting to the stockholders a statement exhibiting the financial position of the company, and furnishing data which may possibly assist in deciding upon future operations, the auditor, if employed as the agent of the stockholders, will exhaustively examine and check all books of account and all the financial affairs of the company.

(368) THE AUDITING OF A MINING COMPANY'S ACCOUNTS.

The comprehensive audit of the accounts of a mining company is extremely important in its relations to the legal situation and obligations of the corporation, the personal liability of the directors and the interests of the investing public. A consideration of the subject as affecting the professional duties and fixing the responsibility of a mining engineer engaged in the expert examination of a mine, or in charge of mining operations, is equally im-

portant, though this phase of the question is not often presented systematically.

Business customs have pretty clearly established the purposes and principles of an audit. But in the absence of statutes compelling strict periodic investigations of their financial affairs, many companies of excellent repute do not avail themselves of the advantages afforded by such an audit. On the other hand, the failure of many companies to make public the true state of their affairs by means of an adequate financial audit is the frequent cause of loss to investors. The value to both parties of a systematic and thorough examination of company accounts is becoming, however, more and more generally appreciated; and it is to be hoped that this may result in suitable legislation, requiring an annual audit of the accounts and financial affairs of all private corporations, and providing for the license and registration of competent professional accountants. Such a rule would tend to eliminate that element of fraud and the consequent danger of loss, to which the stockholder is exposed, when he is forced to rely upon officials for information relative to the standing of the company in which he is interested. True, a financial audit offers no protection against the false or erroneous statements of the condition of the mine itself. Nor will it assist stockholders in penetrating the mysterious reticence or paradoxical ambiguity with which boards of directors muzzle their reports regarding the present condition and future prospects of their mines—a policy of concealment and of mystification which operates, as positively as tangible fraud, to enhance the element of speculation present, in varying degree, in all mining enterprises.

But it is safe to say that in a mining venture, where risk is always expected, capital will more readily seek investment, and stockholders will more cheerfully assume risk and more willingly support any reasonable policy of a board of directors, if good faith and frankness are shown by regular and comprehensive reports and audits.

INSPECTION OF ACCOUNTS BY MINING ENGINEERS.

In examining a mining property for clients who contemplate purchase, the mining engineer often finds it necessary to make an exhaustive search through the accounts and records previously kept by the owners of the mine. This is, perhaps, most frequently the case when it is desired to ascertain the actual cost of mining at a producing mine. If such a mine has been operating sufficiently long to have established a fairly uniform cost, he may be warranted in accepting the figures given by the owners, supplemented by only a cursory inspection of the accounts. But in cases of doubt or suspicion, it may be desirable to verify the figures given. While some mining companies, in calculating the cost per ton of the ore extracted, include all expenses of deadwork, development, explorations, etc., many others state as the cost of extraction-work the actual expenditure for stoping and hoisting only, treating the development work, especially in shaft-sinking, as a " capital " expenditure. Practice in classifying expenditures in this respect, and the arrangement of

accounts relative to mine-costs, is so varied that an engineer can satisfy himself only by an examination of the books, if he would know what items are included in the cost. Particularly in considering a "low-grade" proposition, where accurate data is absolutely necessary, it is an immense advantage to be able to determine in detail, by personal investigation, the actual facts.

Of course, the present worth of a mine cannot be determined by the amount of its past dividends; yet, in many instances, the gross earnings, as represented by the tonnage and value of one already produced, may have a signal importance in considering the future relation of profits to operating expenses.

The value of the product of the various stopes, as shown by the record of ore sales, affords the closest possible check upon the values obtained by sampling the several ore bodies from which ore has been shipped. A determination of the tonnage and value of "ore in sight" is naturally the first consideration of the engineer. But in his judgment of the mine as an investment, the item of cost is a factor of equal importance. From no other source can he obtain such accurate detailed information relative to the costs and charges of mining as from the books and past records of the mine under examination.

THE CONDUCT OF THE AUDIT.

Since the mining business is so radically subject to local condition, it is to be expected that the forms of records and accounts will be varied to suit each special case. And, although the principles of accounting are fixed, there exists almost as great diversity in the systems of accounts in use as in the forms and registers employed. With due appreciation of the difficulties likely to arise from lack of uniformity, the following general suggestions are offered as to the manner of conducting a practical audit of mining accounts.

In the majority of instances, a mine is owned and operated by a corporation, the main or financial office of which is far from the mine. This makes it practically necessary to consider two sets of accounts; those conducted at the mine, which directly concern the mine management, and those belonging to the province of the secretary, which constitute the permanent financial records of the company. The mine office accounts, in full detail, together with vouchers, are usually forwarded at regular intervals to the main office, where a general audit is made, there being at the mine office but a local audit or checking of the accounts. For the present purpose, however, it may be assumed that all the records are kept and all the accounts conducted in the office at the mine.

LIST OF BOOKS.

In order to plan an intelligent dissection of the accounts, it is necessary to know why they are put together. To this end it will be well, first, to

secure from the person in charge an explanation of the system employed, with a list and description of the books used. Indispensable, of course, to the double-entry set of books usually kept at a mine are the cash-book, journal and general ledger. In addition to these, and to the several subordinate record books, blotters, etc., which convenience demands, a well-regulated system of mine accounts ought to include books of ore shipments and of mining costs. The former should show in detail the lots of ore sold at the mine or shipped, identifying each lot by number, and giving dates of shipment, date of payment, weights, terms of settlement, values, and net returns, and also specifying the stope or heading in the mine from which the lot was mined. The costs book, in the nature of an independent or special ledger, is kept to relieve the general ledger of the burden of the many accounts necessary when accurate record is made of the costs chargeable to each separate place of working in the mine. Cost-keeping is one of the most important departments of mine-accounting; and the costs book, when properly conducted, is a regular monthly statement and analysis of costs, itemizing the cost of labor, material and supplies, and distributing the power and operating charges, and the indirect or fixed and general expenses. Moreover, it is also a special ledger, containing an account with each place of working, in which are charged monthly the itemized costs as above, and from which are carried, by journal entry, the totals only of the month's expenses to a "Cost of Mining" account in the general ledger.

The general ledger is considered the principal book, being the source from which is obtained all classified information relative to the financial condition of the business. But it may be well to suggest that, although this book is the receptacle for all transactions, in whatever book the entries may originate, the ledger itself is generally ignored by courts of law. The "book of original entry" legally defined as that in which the preliminary record or entry of a transaction is first written, is accepted as authority on all questions involved in a transaction or in a series of transactions.

CAPITAL STOCK, TREASURY STOCK, WORKING CAPITAL.

The capital stock comprises the full amount of the capital authorized to be raised by the charter or articles of incorporation. The treasury stock is the stock, over and above the amount subscribed and paid for when the company is organized, which is set aside and held by the treasurer, to be sold for the purpose of securing funds to carry on operations. If the entire capital stock was subscribed and the whole amount paid in was absorbed in the purchase of the mine and the necessary equipment, and further capital is needed to carry on work, the stockholders may, by agreement among themselves, instead of increasing the capital stock, donate pro rata a certain number of shares to be held and sold by the treasurer for working capital. A working capital account is sometimes opened with a credit of a certain amount of the subscribed stock or capital, this sum being set apart for use in prosecuting the development of the mine, etc. These accounts should probably receive

first attention. An examination of all entries should be made from their origins in the auxiliary books to their final posting in the general ledger. The principal books auxiliary to the general account books of a corporation are the subscription book, installment book, transfer book and stock ledger. The stock ledger is used solely for carrying accounts with stockholders of their respective holdings in the company. All the other books mentioned are books of original entry, subsidiary to the stock ledger. Examination of these books should establish the fact that the capital stock in the general ledger is credited with the full amount of the authorized capital, whether paid or not. If it has not been fully paid, an open subscription account will probably be found in the ledger, exhibiting the amount of stock subscribed and paid for. The amount issued and paid in should correspond with the aggregate holdings as shown on the stock ledger. A close scrutiny of the treasury stock account or working capital account, if either exist, should be made, to ascertain the character of the account, and how it was created. If there is treasury stock on hand, carried as an asset, the amount should be noted.

CASH RECEIPTS.

A complete audit involves a careful and systematic checking of each and every individual transaction during the period under audit. The opening and subsequent entries covering cash receipts for capital stock subscriptions paid, and for treasury stock sold, should be examined and checked. The records of sales of treasury stock should be critically examined, and the entries traced to their final exhibit on the books. If stock is sold at par, "cash" will, of course, show the proper debit entry for the amount received. If disposed of at less than par, or if sold at a premium, the entries covering the balance of difference between the amount received and the nominal or par value of the stock, as well as the cash entry, should be carefully investigated. Strictly speaking, the discount on stock sold at less than par is not a loss, nor is the premium on stock sold above par a gain, of the business proper; and the amount in either case will probably be covered into the working capital rather than the profit and loss account. Frequently, however, especially if a profit has been realized on such sale, the amount is carried directly into profit and loss. Practice varies considerably in the conduct of accounts relating to treasury stock and working capital. But in whatever manner transactions of this nature are recorded an audit will prove its efficiency, if it determines that fictitious values are not given in the accounts representing resources, actual liabilities, expenses, or any other account affecting profit and loss.

Practically the only revenue of a mine is derived from the sale of its product, in whatever form (crude ore, concentrated matte, bullion, etc.), it may be marketed. All items of cash, as shown on the cash book, should be checked; but this one principal item, should be verified by comparing the receipts, as entered, with the ore shipment register, and with the settlement sheets or statements rendered by the smelter or other purchaser. Such a state-

ment is rendered for each shipment separately by all ore purchasers, or, in the case of a company smelting the ores from its own mine to crude bullion or matte, by the refinery to which this product is sold.

CASH DISBURSEMENTS.

All items of cash disbursement should be checked and compared with the vouchers or proofs of payment.

If the "voucher system" is employed, and transactions are recorded by classification in a voucher journal, from which the totals of like debits and credits, instead of individual items, are posted, the work of checking and comparing the itemized expenditures will be confined to this book of first entry. The footings of this journal are then verified, and the posting of aggregate totals is regularly checked.

A critical examination of the vouchers should be made to ascertain whether the payments were properly authorized and certified.

Pay-rolls should be examined to see that they are properly and duly signed by employes, and that the totals of each are correctly entered.

The balance of cash shown by the books should agree with the amount of cash on hand and in bank, less the amount of outstanding checks not yet presented for payment.

After the purely mechanical checking of all entries and postings from the cash book, journal, etc., and the verification of their arithmetical accuracy, the next, and essentially the most important step is to trace each entry from its inception to its final posting, with the view of detecting errors and irregularities, whether of ignorance or of intentional fraud.

This critical examination is of considerable moment, particularly if the audit is made under conditions exacting a close discrimination between expenditures of capital and of revenue.

CAPITAL.

Capital expenditure accounts are debited with all disbursements which result in the acquirement of something of a permanent value.

Such entries require very careful inspection, not merely to prove clerical accuracy in recording the transactions, and the vouchers and receipts covering them, but also the legitimacy of their classification as capital expenditures. A systematic investigation of the amounts carried to capital, and of all entries of amounts expended and covered into the accounts of buildings, plants, machinery, equipment, air pipe lines, water mains, etc., etc., should afford an approximate verification of the correctness of these property accounts, and put to proof the fairness of the valuation of the several plants carried as assets.

These accounts should be scrutinized also, to see that they are duly credited with amounts written off, from time to time, for depreciation. Such amounts, taken out of income for deterioration of plant, are usually debited

to profit and loss direct, but are sometimes carried by a charge to a depreciation account.

A close discrimination between expenses properly chargeable to capital and to revenue, respectively, is of vital importance; for it is apparent that if too great a portion of the expense of any year be charged against capital, then the correct expense will appear smaller and the profit correspondingly greater. On the other hand, if the entire cost of plant and equipment, or of improvements, which, for all practical purposes, may be considered of permanent value, is charged against the operating expense or cost of mining of any year, a true profit with respect to the ordinary working expenses and receipts may be made to appear as a loss. If the whole, or any portion, of the development work of a mine for any year be charged to capital and the current operating expense be relieved of this cost, the apparent profit will be unduly increased.

In the business of mining, custom has not yet established a uniform method of treating expenditures for renewals and repairs of machinery, plant and equipment. In fact, the question of distinguishing between capital and revenue for sums expended in the original purchase, enlargements and improvements of plants is a matter of individual concern and choice. Some companies treat every expenditure for machinery and equipment as fairly chargeable to the cost of mining for the year during which the purchase was made. Practically this method may be said to be correct; since the sums so expended are part of the expense of mining, and must eventually be repaid by the revenue derived from the sale of the mine's product. Other companies are too prone to treat as capital not only the original purchase price, but all sums expended for improvements, and for renewals and repairs as well. And some companies do, while others do not, make provision for depreciation. In any event, an examination of the accounts should prove that the aggregate amount appearing in capital accounts as expended for machinery, equipment, etc., is represented by plant of that value, maintained in efficient repair.

As stated, an approximate verification of these amounts can be arrived at by tracing from their source all entries for items so charged. For example, in case a mining plant is purchased and erected under contract, it is easy to determine its original value by reference to the contract. The erection of plants, the installing of machinery, etc., when done by a company by day's labor, involve a careful consideration of the cost of labor, as well as of material and supplies.

It must be confessed that the wages account is the most difficult of all to check effectually, especially in trying to distinguish between capital and revenue expenditures, when mining operations and construction are carried on simultaneously, and more especially when a company has no system of keeping and correctly recording amounts expended for wages. Where such a system exists, and where the records of one department are examined and checked by another and independent department, it will not be troublesome to

arrive at a comparatively accurate proving of the correctness of all wages charged to capital.

REVENUE.

In a mining enterprise of any magnitude the debit side of this account represents the expenditure of considerable money. An audit to determine the actual amount, and the correctness of the entries, of expenditure of revenue, must be very comprehensive.

The vouchers and receipts, in addition to the checking on the cash book, must be critically inspected, and the classification and distribution of the expense represented by each voucher must be verified.

Mining supplies purchased are charged to revenue when used, not necessarily when paid for. This requires an exhaustive investigation into the nature and conduct of the stores account, and a complete checking of these accounts, to make sure that all supplies taken from stores are properly charged, when credited to the stores account. The entries covering these transactions should be gone into pretty thoroughly. The prices charged for supplies consumed should be compared with the purchase price, and the cost as stated in inventory. An inventory ought to be taken of all material and supplies on hand, the values being compared with the purchase prices, and the total with the aggregate of the various stores accounts on the books.

Wages, salaries, and all fixed and general expenses, such as taxes, insurance, etc., are direct cash disbursements. All these items, with the possible exception of wages, can be effectually tested by comparing with the vouchers, and by reference, when necessary, to the authority for the payment. As, for instance, the correctness of salaries paid could be ascertained from the directors who had the fixing of salaries; taxes, by comparing payments with the demands of the government, etc.

In the matter of wages, it is impracticable to verify all the items on the pay-rolls which go to make up the aggregate expenditure for labor. The distribution and legitimate "expensing" of the cost of labor can be fairly tested as explained; but an auditor may be obliged to rely to a considerable extent upon the system of inter-staff corroboration referred to above, and upon the certificate of an official in authority, as to the veracity of the various pay-rolls.

If all accounts representing the operating, fixed and general expense of the business are carried into one account "Costs of Mining," at regular intervals, a comparison of the entries in this account with the mining costs book will facilitate a verification of the aggregate expenditure chargeable to revenue.

PERSONAL ACCOUNTS.

Personal accounts, accounts and bills receivable, and accounts and bills payable, should be examined carefully. In the business of mining, accounts of this nature are not frequent, and liability of loss from bad debts or doubt-

ful accounts is limited. Such accounts, and the contingency of such loss, however, should be considered. The amount of accounts due and bills payable, as shown on the books, should be verified and taken into calculation in determining the gains or losses for the period under audit.

FINANCIAL STATEMENT.

The task of checking and verifying all book transactions being completed, the footings of all accounts in the ledger, whether closed or still operative, should be tested, balances verified, and a trial balance taken. This trial balance proving the correctness of the ledger, it is now in order to prepare a statement of assets and liabilities, and a statement of profit and loss.

The financial condition of the company should be very clearly set forth in this financial statement, the balance sheet exhibiting:

PROPERTY AND ASSETS.

1. Property, showing mines and mineral claims and other real property.
2. Improvements, showing buildings, machinery, plants, equipment, etc., also stores and supplies on hand.
3. Cash and investments, showing amount of cash on hand and in bank, the nature of investments, rates of interest, etc.
4. Debts owing to the company, showing all debts, accounts and bills receivable.

CAPITAL AND LIABILITIES.

1. Capital stock, showing in detail the number of shares; amount paid up; amount, if any, remaining unpaid; amount and nature of calls, particulars of forfeited shares.
2. Debts and liabilities of the company, showing the amount of debts owed by the company, enumerating the same, and distinguishing actual from contingent liabilities, such as claims against the company not acknowledged as debts, or moneys for which the company is contingently liable, should be stated; but only the amount of acknowledged debt is carried out as liability.
3. Reserve fund, showing the amount set aside from profits to meet contingencies.
4. Profit and loss, showing the disposable balance for payment of dividends, etc.

The statement of profit and loss should state specifically upon what accounts losses have been sustained, and detail the accounts through which profits have been realized. In calculating the gains and losses, it must be borne in mind that the loss or gain of a mining venture for any given period is not merely the difference between the receipts for ores sold and the costs of mining. Depreciation must always be taken into consideration.

REDEMPTION OF CAPITAL.

In connection with an audit it is essential that the question of deprecia-

tion, dividends, surplus and redemption of capital be taken into account. Most industrial enterprises involve the same elementary principles. But there are considerations in mining which do not affect other kinds of business.

A mine cannot be said to be a permanent source of wealth. Every ton of ore mined and marketed involves a depreciation in the value of the property, which cannot be repaired. Hence, during the life of a mine, not only must interest be realized upon the capital invested, if the venture is to prove successful, but the capital itself must be recovered. In this respect, depreciation and dividends may be considered as different causes operating to the same end, namely, the diminution of the value of the property.

DEPRECIATION.

Generally speaking, the loss upon assets which are diminishing in value is called depreciation. As applied to plants, equipment, mining machinery, etc. (provided the original cost of these items is not treated as a portion of the current operating expense, and so charged at time of purchase), a certain sum, estimated upon the life of the plant, should be charged against the gross revenue of each year, to replace the capital destroyed or reduced by wear and tear. The method of treating sums expended for plant as current expense is manifestly unfair, both to the management desirous of making a record in the matter of mine costs and to the present stockholders; for, in the early stages of a mine, when most of the equipment is purchased, costs will be exaggerated, and dividends which might otherwise be paid may be deferred, by reason of this abnormal increase in the current expense account. But, since the life of mining machinery is comparatively short, and there is practically no residual value, in case the mine is abandoned as worked out, or the machinery has to be replaced by a plant of greater capacity, it is not only prudent but absolutely necessary that some provision be made to redeem its cost.

Depreciation, as applied to the redemption of the capital invested in a mine, provides for the writing off of a certain sum each year estimated upon the life of a mine, to accumulate a sinking fund for this purpose.

In the business of mining, however much may be said in favor of some method of accumulating a sinking fund, such a fund is seldom, if ever, provided for. The individual stockholder usually thinks that he would prefer to have his capital returned to him as fast as it may be taken from the mine, rather than await the accumulation of a fund sufficient to redeem the whole capital. To this end the custom prevails, and will probably be considered the better method, so far as mining is concerned, of repaying capital by dividends. By means of dividends, or, as they might properly be called, enlarged dividends, the stockholder, after calculating a fair interest on his investment, can consider the sums received over and above his interest as repayments of the principal of his investment.

This method may be subject to some question, since there are few (except those who have given special thought to the matter) who properly appreciate the difference between a dividend which is purely a distribution of

profits and a dividend which is intended to repay capital. Then there is this contingency to face: In the case of a successful mining enterprise it may transpire that the full amount of the company's capital is carried as a liability, when, in fact, it has all been repaid in the shape of dividends; while, on the other side of the balance sheet, the mine, valued at its original cost and worth, is still shown.

The amount paid in dividends in this way each year may be estimated, or rather will depend upon the amount of output and the profit realized upon the sale of product.

DIVIDENDS.

The term dividend, as generally accepted, means a sum which a corporation sets aside from its profits to be divided among its members. It is a fundamental rule that dividends shall not be declared or paid when a company is insolvent, or the payment of which renders a company insolvent. A dividend must be declared from realized, and not from estimated, profits. The violation of this rule is not common. But it too frequently happens that when profit does not follow on the heels of promise, the directors of a company anxious to appease the importunity of stockholders are led to ignore one of the most important precepts of financial prudence.. Under this constraint they declare and pay dividends without first having provided a surplus or reserve fund; that is, a special fund or profits set aside for the purpose of meeting contingencies, or of equalizing dividends.

RESERVE FUND.

If such a fund, set apart from current income, or created by withholding a small percentage of the annual net earnings, is shown upon the books, this account should be examined by the auditor, and its accuracy should be tested. The amount should be held, either in actual cash on hand or on special deposit in bank, or invested in safe and readily convertible securities. A reserve fund once established should be drawn upon only in case of urgent necessity, or to meet exceptional and temporary reverses in profits.

The history of the mining industry is replete with records of companies wrecked by adverse circumstances, by reason of the lack of means with which to carry exploration to a probable successful issue—means which might have been provided at a time when the mine was earning regular profits. But with working capital exhausted, stockholders reluctant to pay assessments or to render themselves personally liable for borrowed capital, the ore reserves of the mine worked up to their limit, and no reserve fund to meet the exigency, the mine is abandoned. And thus is recorded another mining failure which a little forethought and business prudence might have averted.

Again, it may occur that a mine in the full flush of prosperity is compelled to discontinue dividends for a period. There would be fewer disappointed stockholders, in this respect, if the policy of providing a surplus were

rigidly insisted upon. Regular dividends could be continued, and a most distressing period in the affairs of a mining company could be safely tided over if, during its most profitable period, provision had been made for such a crisis.

(369) THE WORK OF THE AUDITOR.

The following quotation is from an address by Mr. Robert H. Montgomery, C. P. A., author of the American edition of Dicksee's Auditing, and delivered to the School of Accounts and Finance of the University of Pennsylvania:

Only three kinds of audits, in a narrow sense, prevail, viz.:

1. The examination which involves a mechanical checking of the books and records, the placing of red ink check marks opposite certain figures in certain books, and the making of like check marks opposite supposedly like figures in other books; and the verification of a mass of footings, vouchers, etc., which enables the auditor to say that the arithmetical work is perfect.

2. The examination which consists of a mere inspection of results, involving, as it may be, the analysis of certain accounts, but on unscientific lines.

3. An examination which combines three methods: first, the verification and testing of enough clerical work to insure its accuracy, having always in mind the co-ordination of the accounts, the actual rather than the physical relation of one book to the other; second, a careful analysis of the accounts, a searching inquiry into the entire organization under investigation by a careful search for errors of principle as well as technical errors and evidences of fraud; and, third, an intelligent study of the balance sheet.

Much harm has been done through the practice of making audits of the class first mentioned. A good business man with no knowledge of bookkeeping can make a better audit than a so-called auditor who does not understand how to make an audit. A business man can tell very soon whether an audit is worth while, and if it is not conducted intelligently he does not want a second one. The third form of audit is the only one which will commend the accountant to an intelligent client.

The underlying principles of auditing are theoretical, and are not subject to change to fit particular businesses or special systems of accounts.

These underlying principles are few in number and can be applied indefinitely. Let us examine them.

1. The auditor must ascertain that all of the assets shown by the books to be on hand at a certain date are or were actually on hand.

2. He must ascertain whether any other assets not on the books should be or have been on hand.

3. He must ascertain that the liabilities shown by the books to be owing at a certain date are or were actual liabilities.

4. He must ascertain whether or not all liabilities are in fact shown by the books.

5. He must ascertain whether or not liabilities so shown have been properly incurred.

6. He must ascertain whether the earnings shown by the books are properly accounted for, and whether any of the earnings are omitted therefrom.

7. He must ascertain whether or not the expenses and losses have been properly stated and supported.

The application of all of the above rules will, I believe, result in a proper audit of any undertaking.

The auditor should not be too technical. If the minute book of a corporation whose stock is all owned by four or five persons does not indicate a meeting for several years, although the stockholders' personal accounts indicate that profits have been credited thereto, the auditor should not assure them that they are in a bad way. If the profits have been equitably credited, if the concern has actually earned these profits and is solvent, and if the state has not been defrauded out of taxes, the accountant should not concern himself if the stockholders wish to continue as of yore. Since no court would stop them, the auditor is not called upon to interfere.

Above all, the auditor's work should be of value to his client. The audit should be worth more than the amount of the auditor's fees. Take the case of the manufacturer who also owns horses, and where horse feed has been sold; not one such man in fifty cares whether or not his bookkeeper credits a sale of oats to the stable account, but fifty out of fifty men have a reasonable cause for complaint against an auditor who would fail to discover that oats were being sold, and that stable expenses were increasing beyond reason, the latter being readily discovered by analyzing the accounts and making up a comparative statement; this discovery in turn uncovering the fraud.

(370) CO-OPERATION BETWEEN AUDITORS AND BOOKKEEPERS.

The average bookkeeper does not welcome the professional auditor who has been retained to examine his books.

The salary of the average bookkeeper is less than the wages earned by the worker in most mechanical trades. During the last twenty-five years the wages of workmen have been steadily increasing; during the same period the salary of the average bookkeeper has remained the same.

During the same period the profession of the public accountant has become an actual necessity to the business world.

Many men, formerly bookkeepers, have become public accountants; probably ninety per cent. of the successful professional auditors now in active practice were bookkeepers a few years ago.

But not one of these successful public accountants was an "average" bookkeeper; not one of them would have discouraged the employment of a professional auditor to examine and criticize, or perhaps commend his accounts, or more likely still, to point out so many weak spots, so many unsci-

entific methods that a complete reorganization of his office system would have been ordered.

Why does the business man see at once the advantages of modern labor-saving, result-showing, scientific accounting methods as soon as these methods are explained to him by some one who knows how to explain while the "average" bookkeeper sees nothing but a change in his own routine work? Because the modern American business man is alive while the ordinary "average" bookkeeper is just as soundly asleep as was his predecessor.

A few bookkeepers have awakened; all who have seen the light have had their reward or if they have not yet come to their own, it is inevitable that they will.

But the bookkeepers as a class are too deeply in the rut to move rapidly; I propose to show that the joys and pecuniary rewards of easier traveling are within their reach; in other words, I have a message to the bookkeeper who is intelligent enough to be ambitious, well balanced enough to realize that he can learn something new every day.

A man does not have to be young in years to develop greater efficiency or undertake startling things. One of the most successful public accountants in the United States—professionally and financially—was a bookkeeper until middle life.

Learning something every day is the paramount necessity and will be considered first.

How many bookkeepers realize that business could not be carried on for a single day without them? Is it not a fact that they are so used to seeing the purchasing department, the sales department and all other departments rated above theirs that they simply accept these conditions and meekly submit to subordinations?

The executive realizes the vital importance of his accounting department, but he confesses this to his colleagues and to the public accountant rather than to his bookkeeper. The latter has been largely responsible for this state of affairs, but fortunately there is a remedy easily applied.

WELCOME THE PUBLIC ACCOUNTANT.

The bookkeeper who desires to learn should seek the best, and only the best, sources of information. Let him concede that the public accountant of experience, wide and successful practice and training, knows something more than himself. It is, therefore, not only reasonable but desirable that the bookkeeper should urge and even insist on his employer engaging the services of a public accountant, not only for special but for periodical service. The time is coming when this service will be the rule rather than the exception, so that the bookkeeper who does not seek and welcome the advent of the public accountant will have the latter thrust upon him.

Let us consider two typical cases: "A" is an "average" bookkeeper; he is methodical and does his routine work well; he looks forward to his trial

balance and as soon as one is in order he commences to think of the next one; he submits nicely written extracts from these balances, some weeks or months thereafter, and, as his employer never understands them, they are not criticised; he follows and respects precedent but occasionally adopts some new device or method which rarely works well because the element of co-ordination is lacking; he understands his position, his relative position, for he does not attempt to supervise the records of the operative departments of the business; he is a subordinate clean through.

Suddenly his employer announces that, as his competitors and friends in other lines of business have found the advice and assistance of public accountants extremely helpful and valuable, there will be an audit of his books and accounts in the near future. The bookkeeper is dazed: "Is something wrong?" "No." "Is there any suspicion of my honesty?" "No." "Have my services not been satisfactory?" "Yes." "Then why this innovation, why disturb the peace and comfort of our office routine, why bring in men who cannot know as much about these accounts as I do—I, who have looked after every detail of this office for twenty years?" "Well, I have decided to try it, and we will see if it pays."

The bookkeeper commences to think up plans to thwart the auditor; his books are a little behind because one of his assistants is sick; it is about time for the trial balance and all the books are in use; there is no room in the office for a lot of auditors who will interfere with the current work and upset things generally. But excuses are futile and a day is fixed for the auditor's arrival.

He is about as welcome as a panic, the bookkeeper eyes him coldly, is insultingly courteous and places about as many obstacles in the way of free access as can be imagined. The auditor asks an innocent off-hand question as to some unimportant item or account which may be peculiar to the business under examination, and immediately the bookkeeper seizes the opportunity to express his contempt of a "so-called expert" who "surely cannot know his business or he would not ask such a question." Then the particular book which the auditor wants is always in use or just about to be used. When the auditor asks for vouchers or correspondence bearing on certain matters which on their face require further explanation, he receives no assistance.

These petty differences multiply and finally the auditor loses all hope of the co-operation which he expected, and from that time on ignores the bookkeeper as far as possible, keeps his comments and criticisms to himself and by the end of the audit has unconsciously gained the impression that the bookkeeper is inefficient.

Errors, which in themselves were of little importance, have been scheduled because the bookkeeper would not acknowledge and correct them.

PROVES THE BOOKKEEPER'S ABILITY.

Naturally, all these things are reflected in the auditor's report; he is obliged to go into details of errors where general observations should be sufficient. All the weakness of the system, all the suggestions for improve-

ment, are detailed and elaborated because the bookkeeper declined to accept well-meant suggestions during the course of the examination, and the auditor feels that it is his duty to have his client receive the benefit of what he pays for. The report is discussed and the auditor is asked his opinion of the bookkeeper's ability.

The results of cases like the foregoing are by no means uniform. Sometimes the bookkeeper has gained such a foothold in the business that he can minimize the auditor's efforts and persuade his employer that the audit has been a useless expense. Sometimes he ostensibly falls in with the suggestions in the report and promises to give the new ideas a fair trial, but subsequently applies so little judgment and good faith to their execution that the improvements become impediments, greatly to the satisfaction of the bookkeeper, who thereupon proves to his own, and sometimes his employer's, satisfaction, the worthlessness of accepting suggestions from a "so-called expert."

Sometimes matters go along about as before, the report is ignored and the bookkeeper jogs along in the same ruts and at the same salary. In many cases, however, the employer realizes that he has not received all that he was entitled to; perhaps he has had all that he paid for, but in these days business men actually like to raise salaries. What sane business man will decline to spend an additional thousand dollars in a man's salary if he can see a saving in expenses or gain in income of two thousand? And the competent bookkeeper can so arrange as to enable the employer to make the gain or save the expense; he must, however, not only learn how, but he must know it so well that his employer will see it too. The best way for a bookkeeper to learn how to arrange figures is to study the reports of public accountants. The next step is when the employer inquires as to where he can get a man with sufficient ability to give him what he wants, and it is a foregone conclusion that when the new man is engaged he will receive a larger salary than his predecessor.

Bookkeepers rarely realize, and seldom appreciate, that public accountants, in season and out, advocate larger salaries for office men, and that in numberless cases they are directly responsible for increases which would otherwise never materialize.

Aside from all other reasons, it would seem that the salary question alone would lead all bookkeepers to insist on audits of their accounts by public accountants. It is like betting on a sure thing, for, if a bookkeeper is reasonably intelligent and if his books are in fair condition, he can, by co-operating with an auditor, make himself so much more valuable to his employer that the raise in salary is almost inevitable; the "sure thing" part of it is that no bookkeeper falling within the class mentioned ever had his salary decreased.

RESULTS OF CO-OPERATION.

Let us examine a little more closely into the possibilities of co-operation where the bookkeeper is wide awake and is determined to work himself out of the "average class."

"B," during his early career, was an "average" bookkeeper, but one day he received a sample copy of a business magazine and, in looking it over, he found several suggestions which could be applied to his own books with a saving in time to himself, and a corresponding increase in his usefulness. He subsequently followed up the best literature he could find and made many other improvements. Finally, he came to the conclusion that the entire system of accounts needed a complete overhauling, rather than the tinkering which he had been applying on his own account. By this time he had become broadened and was on better terms with departmental heads, as well as his employers, who had found an amazing difference in the reports and analyses which he had been forcing upon them. Much to their surprise, the bookkeeper had proved beyond a doubt that one of their pet departments had been running at a loss, and the conversion of this loss into a gain had been due entirely to the bookkeeper's initiative, so when he made a suggestion they were ready to listen.

He told them that their system still lacked many of the improvements and refinements of modern invention; that he had gone as far as he could with his limited time, opportunity and experience; that the best investment the firm could make would be to retain a firm of public accountants to make a thorough audit of his accounts and to formulate and install a proper system. His advice was followed and accountants were engaged. There was no delay in extending to them the freedom of the office. Without "butting in," "B" was always on hand to explain and assist and, incidentally, to learn.

When a criticism was made, he discussed the point at issue on its own merits without once considering that some of his own ideas were being attacked. When he realized that a valuable suggestion had been made, he yielded instantly and usually took steps to make effective good suggestions without delay. On the other hand, he was able materially to assist the professional accountant in the formulation of the new system, and the latter found many times that his own ideas were impracticable of application to the particular business under investigation, and that the views of the bookkeeper were the practical ones.

By the time the formal report was submitted to the partners its application was under way. The report stated frankly that the old system was crude and expensive, but it also mentioned that the weak spots were in the nature of traditions of the house and that many had been eliminated by the bookkeeper. The latter was highly commended and immediately after the new system was installed and, as a result of a conference, his salary was doubled.

The subsequent histories of the bookkeepers who have been as alert as the last described, can readily be imagined. Cases like the foregoing are not so rare as might be expected; as a matter of fact, the instances cited are drawn from actual experiences.

It is possible, of course, that the public accountant is sometimes to blame. Co-operation presupposes more than one party, so if the accountant does not do his part towards utilizing all the information and experience possessed by

the bookkeeper, the latter naturally assumes an antagonistic, or at least, a somewhat unsympathetic, attitude.

The professional accountant, however, is in a receptive mood as a rule, for it is a very necessary part of his training to learn that constant vigilance is the price of success. He not only learns something new every day, but he must learn several new things every day.

It frequently happens that an accountant criticises methods which some other accountant or, more frequently, he himself has suggested or installed at some previous period. The methods in question no doubt were the best at the time of their installation, but, as it is the life work of the public accountant to invent and adapt, it follows that he becomes dissatisfied with his own systems and methods, and is continually making improvements.

The bookkeeper or accountant (and we can very properly include the business man), who pats himself on the back and announces that he has at last reached perfection, is in a bad way, and is marked lor ultimate failure.

It is the general experience of public accountants that the offices presided over by bookkeepers who announce with confidence (sometimes arrogance) that their books and accounts are in perfect order and that improvement is impossible offer the most fruitful field for criticism and house-cleaning. On the other hand, the man who freely admits that he does not know it all and who welcomes investigation, will usually pass through a rigid examination with flying colors.

The public accountant and the bookkeepers have so much in common that there is no excuse for a lack of co-operation. If they will meet each other half way each will be benefited, and more important than all the man who pays them will receive a little more than the worth of his money. Those who contribute to this ideal state can consider their day's work well done and they will be justified in placing themselves in the producing class and thus escape the odium which attaches, rightly or wrongly, to those who take from, but who do not contribute to, the wealth of the nation.

Are you an "average" bookkeeper?

(R. H. MONTGOMERY.)

EXERCISES.

1. What is the general course for an accountant to follow in making a regular annual audit of the books of a manufacturing corporation?

2. Where a number of manufacturers contemplate consolidating, what means should be taken to insure the statements of assets and liabilities and profits being on the same general plan?

3. What is the best method for carrying additions to plant on the books of a manufacturing corporation? Give reasons for answer.

4. Is an auditor in any way responsible for the validity of the transactions shown on the books of a business? What means should be taken by an auditor to satisfy himself of the accuracy of the entries on ledgers, cash books, journals and sales books?

5. What is the auditor's responsibility in the matter of vouchers for payments? What is his responsibility where there are not any regular vouchers?

6. What duties and responsibilities has an auditor in connection with inventories of goods on hand? Can an examining accountant satisfy himself of the general correctness of inventories without himself taking the quantities and verifying the prices, extensions and additions? Give full particulars.

7. Where the books of a co-partnership or corporation show large additions to buildings and machinery, consisting of portions of pay-rolls, without explanation, what means should be taken to prove or disprove the accuracy of the charges?

8. How would you account for the proceeds of sales to customers without checking each entry?

9. What means should the auditor take to satisfy himself that the debts of a business are on its books?

10. If a company, duly organized, acquires several plants that are found to be in a "run down" condition and to require extensive outlay for repairs and renewals to bring them to the required state of efficiency, should such outlay be charged against capital or against revenue? Give reasons.

11. A reserve fund of $250,000 has been set aside out of the profits of a company and invested in government securities at par. How would the investment account appear on the balance sheet of the company (a) if the value has increased, (b) if the value has decreased? Give reasons for your answer.

12. What do you understand by the term "Secret or Hidden Reserves?" Mention four *bona-fide* uses of a secret reserve and state your opinion as to the propriety or otherwise of the creation of such "reserves," giving reasons.

13. In a case where the preferred shares of a company are issued under a provision that the annual dividends to which they shall be entitled shall be "cumulative," would you consider it necessary to show any arrears of dividend as a liability upon the balance sheet, or how would you deal with it?

14. In Bank Accounting what check has the General Bookkeeper on the Individual Ledgers and what check has the Auditor on both the General Bookkeeper and Individual Bookkeepers?

15. How could a General Bookkeeper, who marks off certificates of deposit on register, manipulate this account? If you were appointed Auditor, where such loose methods had been allowed, how would you satisfy yourself as to the accuracy of the balance as shown on the General Ledger?

16. In what way is the cash of a large bank counted by an Auditor without an assistant and what should he guard against?

17. Illustrate a convenient form of reconcilement and explain why all debits from both their statement and your ledger are placed on one side and all credits on the other, and reconcile the account of the New York bank using the balances and exceptions as given under paragraph 239, pages 374 and 375, A. B. & A. E., using your form.

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